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ENVIRONMENTAL CONDITIONS FOR AGRICULTURAL DEVELOPMENT

(1) EDUCATIONAL ENVIRONMENT

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IN past centuries development of agriculture was everywhere achieved by bringing larger areas of land under cultivation. This was done by breaking up woodlands, draining marshlands, and irrigating deserts. In cultivating the new lands, the same methods were used as on the old. Contacts with towns were scarce, chiefly made by fairs and markets, where some of the produce was sold and some goods bought which could not be procured from the land. The education of the peasants was in the family, and the experience of the elders sufficed to instruct the next generation in methods of cultivation and breeding of animals. Thus crop-growing techniques were passed down from father to son. In Mediterranean countries, for example, wheat, vine, and olive have been grown by the same methods for a thousand years.

The social structure of countries where three-fourths or more of the population were rural, showed a minority of citizens attending school to learn a trade or profession, against a majority thought to be not in need of schooling because it would practise farming in line with tradition. But when agriculture changed from an activity based primarily on household consumption to one producing goods for the market, the use of modern techniques became important. For these make it possible to reduce costs and so to meet competition, which is strengthened by improved transport and expanding production.

This profound change in agriculture has shown the importance that education of rural workers has in the development of agriculture. This was especially so when the discoveries of science were multiplying and fostering new technologies, and the rural workers of the world—in contrast to those in industry—lived on, remote from schooling or cultural development. Indeed, illiteracy is still a gloomy feature of rural environments today. Through it the people remain ignorant of those techniques which could raise them from their present condition of inferiority.

¹ In the absence of Dr. Medici his paper was read by Dr. C. Vanzetti.

Education as a condition of economic development

It has often been thought, especially in agriculture, that it is capital which conditions economic development. And if education be considered as personal capital, accumulated in *man*, we can affirm that agricultural development depends above all upon the amount of capital available. *In this case it is explicit that education represents one of the various kinds of capital, human capital*, the complement of the other kinds of capital, of which it allows better use to be made. But education, while having the economic characteristic of capital, differs from the things which constitute other types of capital. The forming of mind and character does not exhaust itself in the economic fact since it helps to mould the social environment in which man projects his personality and creates the civil and political system of the country in which he dwells.

Although in studying problems of development we should avoid the traditional separation of components that are clearly economic from others that are cultural, we cannot but recognize that the latter are, by their nature, more complex and have their origin in motives not purely economic.

In the past, school was attended only by minorities, from which the multitudes of peasants were excluded. It is only since the formation of modern democracies that scholastic institutions have undergone such changes as to be considered the foundation of democratic life. Obligatory schooling was first promoted in America by Jefferson, but a century had to pass before laws tightened the links that bind education to the society it serves.

Last century school attendance systematically increased, but still appreciable numbers of children receive no schooling. Thus, all over the world, children—generally of rural workers—remain without that heritage of learning which lessens inevitable inequalities in socio-economic conditions. They are left without that store of knowledge which on the one hand would increase the productivity of their labour and on the other would afford them a wealth of notions which would shape them to modern democratic ways of living. This is why statesmen affirm that sums spent on education represent the investment that offers the highest return. It is seen in the fact that labour productivity increases as the level of education rises.

Economic development of agriculture and the democratic way of life

Apart from the fact that education is essential to the development of modern agriculture, democracies have peculiar need of a high level of education for all citizens. A democratic way of life finds its

defence in the people's capacity to tackle common problems and make wise choices.

One cannot conceive agriculture nowadays dissociated from a democratic organization of the State. For this reason, the development of agriculture is assured when the State is able to create a system of education that responds to the society it has to serve. And the complexity of the processes of production in agriculture has given to the educational problem an aspect that was unknown in the past: that of *vocational instruction*. Thus the link between school and occupation has become more apparent. It is seen how reciprocally dependent they are. *Therefore scholastic institutions must be considered an integrative part of a policy of agricultural development.* Schooling should help young people to discover their aptitudes, so that those who remain in agriculture can enjoy an activity which not only produces income but offers scope for self-expression. Because farming is traditional—that is, it can be practised by illiterates who have learned the art from their fathers—vocational training in agriculture is a fruit of recent times. As forms of farming changed and techniques became all-important, it was realized that agriculture needed not only diligence and patience, but also workers able to use efficiently the machines, fertilizers, and pesticides that are available today. In fact it is well known that even in the more advanced countries, quantities of these chemicals are wasted because of ignorance. Also through lack of training serious errors occur in management, such as to reduce productivity. This is why development of agriculture is closely linked to development of education. An inadequate labour supply is a great obstacle to achieving a balance in economic progress. This is seen everywhere and especially in under-developed countries, where the factor that limits development is *human capital*. Indeed, it has been asked whether it is worth while creating new jobs unless effort is made first to increase the skill of the workers.

In a society that is rapidly evolving economically and socially, the demand for labour is subject to continual change in regard to both quality and quantity. Economic development in fact has the effect of gradually reducing the labour employed in agriculture and increasing that employed in industry and in services. Within the sectors of production, occupational skills vary and multiply. This is due principally to evolving techniques and methods of organization which by increasing the need for qualified personnel, bring about changes in the composition of staffs.

Since schooling now represents the main instrument of economic transformation, the vocational training of rural workers must enter

the scholastic sphere. It is a question not only of creating institutions able to keep pupils in step with the changing realities of the rural world but also of preparing sufficient recruits for an agriculture which, becoming modern, demands exact knowledge of machinery, agronomy, and animal husbandry. This difficult task can be fulfilled only if the scholastic policy is decided upon within the framework of a wider policy of economic development in which agriculture occupies a key position.

The education of farmers

The farmer is one of the most complex figures of the modern world. Few realize that the noble art of farming is difficult, whether for reasons inherent in the nature of the business or on account of the many different qualities required for practising this art. The fatigue, the risks, and the expenses of farming bring only modest profits. As usual, the superfluous rather than the necessary, finds the greater remuneration. New trades yield more, and the ancient ones are therefore left aside. Pupils become quickly aware of deficiencies in the teaching and are thereby easily induced to abandon agricultural schools. To tackle the problem of agricultural instruction implies use of adequate funds. The teachers should have the same level of pay as in other schools and should have the technical and didactic equipment necessary to render their teaching profitable.

Features of agricultural schools

The chief risk these institutions run is to become schools where agriculture is taught by abstract methods. In this case they become schools that furnish a bundle of notions regarding the natural sciences and mechanics, but do not teach agriculture. This is still an art, one that can be practised more or less well according to the theoretical notions possessed, but these are never sufficient to make a good farmer. Modern farming requires knowledge of chemistry, physics, botany, and zoology, but always demands to be shown how a technique suggested by a determined scientific discovery can be put into effect. Therefore an agricultural school should always have a farm and should be situated in the country, so that students have immediate contact with plants and animals. Thus theory can find direct application and the efficacy of the lessons is increased. The specific needs of such schools call for considerable outlay by the State. Instruction will benefit if schools can offer residential facilities so that students can follow crop cultivation and breeding more effectively.

The school does not solve entirely the problem of education in agriculture

When economic development is taking place in countries where the percentage of population engaged in agriculture is high, the drift from the land is particularly marked and continuous. Those who go are the young ones who very often have attended agricultural schools. They have acquired specific knowledge of farming, but conditions in the labour market prompt them to seek other activities. And they are helped in this by the basic obligatory instruction received and by a specialization that comprises notions of agricultural mechanics, useful in other sectors. The result is that those left in agriculture are the older ones and those young ones who have less knowledge and initiative. Hence the need for two forms of intervention, met with in almost all countries. These are (a) vocational instruction for adult rural workers, and (b) technical assistance for farmers.

Vocational instruction of adult workers, sometimes illiterate, cannot be achieved by purely scholastic methods. The age of the pupils and the experience they possess suggest that a practical, not theoretical, content be given to the lessons. The time should be devoted to demonstration, in the shape of practical lessons that teach how to carry out something which experience has revealed as having good economic results.

Technical assistance can help farmers to increase productivity on their holdings and can broaden their outlook on innovations. It consists in putting at the disposal of farmers, technicians who can help them to improve the set-up of their enterprises, having regard for soils, climatic conditions, and market situations of products and raw materials. When such assistance becomes systematic, farmers soon acquire a good stock of ideas and the level of their farming knowledge rises.

W. I. MYERS, *Ithaca, New York, U.S.A.*

In his excellent paper, Professor Medici has given us a comprehensive over-all statement of the changing needs for education of rural people in the evolution of agriculture from traditional self-sufficient production to modern commercial farm operation. Dynamic agricultural development is dependent on education not only to assist in the allocation of workers between farming and other occupations and in strengthening democratic government, but also to enable farmers to make effective use of modern farm machinery and technology. Since I am in general agreement with Professor Medici's principal arguments, I shall devote my time to an attempt to em-

phasize some aspects of education that seem to me to be of particular importance in the agricultural development and economic growth of less developed countries.

In countries with a high proportion of the population engaged in agriculture, primary consideration should be given to agricultural development as a fundamental factor in economic growth. Increased output of adapted farm products is essential to provide not only an adequate diet for the nation but also for export to assist in financing desirable industrialization.

Greater urgency is given to agricultural development of less-developed countries by two factors that have become much more important in recent years. One of these is the *rapid increase in population* owing to the maintenance of high birth-rates and the decline in mortality. The other is the burning desire to improve levels of living with maximum speed. This is especially strong in the new nations which have recently emerged from colonial status. Under these pressures it is not possible to be satisfied with the slow evolution of agricultural development that characterized the countries of western Europe and North America during the past half century. With a net population increase of 2 or 3 per cent. a year, it will be necessary to achieve a larger continuing gain in national output if levels of living are to be raised. The experience of the older nations reveals principles which, if followed, will enable the less developed countries to achieve agricultural development at maximum sustainable speed and reasonable cost.

The only way in which any nation can achieve higher levels of living is by increasing the output per worker throughout the economy—on farms, in factories, and in other business both public and private. The surest and best way to provide a dynamic agricultural base for economic growth is by a comprehensive, consistent, and well-planned programme of agricultural research and education. Modern agricultural technology is not a commodity that can be imported and applied on farms like a new highly potent fertilizer. General principles of the use of irrigation, improved seeds, fertilizers, and pesticides can be obtained from research in the more fully developed countries, but it is neither practical nor profitable to imitate such practices exactly because of differences in soil, climatic, economic, and social conditions. To be practical and constructive, improved practices must be adapted to conditions on farms in each country by means of research by well trained agricultural scientists.

Every under-developed country must start where it is and achieve progress from that point. The real problem is how to improve present

methods of farm production in the most effective and profitable way. This requires research to determine the important factors limiting production and the best practices to increase yields under conditions in the country concerned. The next step is to arrange demonstration plots in different soil and climatic regions of the country to learn how the suggested practices apply under varying local conditions. The final step is to teach farmers how to use improved practices that will be profitable on their farms. This programme takes time, it requires trained men, and it involves substantial costs, but there is no short cut to rapid and sustained agricultural progress.

Although deficiencies in other forms of capital often receive more public attention, the most serious handicap to economic growth of less-developed countries is the shortage of trained men and women. This shortage is very acute in agriculture and will continue to limit agricultural development until it is corrected. In fact the success of many important national programmes such as credit and land reform now under consideration in these countries is jeopardized by the wholly inadequate supply of trained men, especially agricultural economists. Hence an agricultural college with a competent well-trained staff and adequate consistent support should have top priority in a sound programme of agricultural development. Teaching, research, and extension are indispensable parts of an effective system of agricultural improvement in order to train the men needed, to obtain by research the new information necessary, and to get this information to farmers who can use it to increase production of crops and animals.

The mutual stimulation of agricultural teaching, research, and extension is essential to rapid and sustained progress in agricultural education. One of the most serious handicaps to agricultural development in many less-developed countries is the complete administrative separation of agricultural teaching, research, and extension among separate governmental agencies and organizations. One result of this is inefficient use of scarce trained men. Another even more serious difficulty is that under these conditions agricultural college teaching is largely abstract and academic with little if any training in the use of modern scientific methods to increase farm production. It is not surprising that such colleges attract inadequate numbers of students since they do not provide satisfactory training for effective service in modern agricultural development in governmental organizations or in private business firms. Furthermore, extension recommendations are not respected or followed by farmers because they are not based on research applicable to farms in their areas.

In view of its basic importance to agricultural progress, strong efforts should be made to combine administrative control of agricultural college teaching and research in one organization and, if possible, to include agricultural extension as well. However, even where the severe handicap of separate administrative control cannot be corrected promptly, it should be possible to attain reasonable co-operation among the staff members engaged in these interrelated functions for their mutual benefit and the improvement of their work. Adequate salaries are required not only to obtain and retain the *full-time services* of qualified scientists but also to attract more able students to seek careers in agriculture if the needs for trained men are to be met. Salary scales should encourage postgraduate training, should recognize exceptional performance, and should be maintained in a fair relation to other professions.

In many less-developed countries, the lack of secondary and even of elementary schools in rural areas prevents farm boys from getting college training in agriculture or in other professions. This unfortunate situation results in having few leaders who are familiar with farm problems, and is a major factor contributing to the inadequate enrolment in colleges of agriculture in the countries concerned.

In any well planned programme of agricultural development and economic growth, major attention should be given to providing more and better elementary and high schools for rural as well as urban people. This national system should also provide for vocational education in agriculture at the lower levels and should be integrated with colleges so that qualified rural boys and girls can progress to college in order to prepare for careers in agriculture or in other professions.

The greatest resource of any country is its human capital. Fortunately, there is no *deficiency in natural intelligence* even among citizens who are severely handicapped by illiteracy. The cost of an adequate system of elementary and secondary education is an investment in public welfare which will pay high returns in increased productivity throughout the economy and a better life for all citizens. While the results of education are less spectacular than modern buildings and impressive scientific equipment, they are more important in achieving economic growth and political stability.

The importance of elementary and even secondary education for rural citizens has been greatly increased by the development of modern scientific agriculture. In addition to assisting in allocating workers and in strengthening free government, education stimulates the desire of farmers to increase production by suggesting new wants

to be met by this means. Literacy of rural people is essential in teaching farmers how to apply modern technology in farm operation in a continuing programme to increase farm productivity. Modern scientific methods of production involve the purchase and use of fertilizers, pesticides, and improved seeds as well as the sale of farm products to repay their cost. Education is necessary to enable farmers to learn how to make wise choices between enterprises, how to choose the best methods of production for their farms, how to buy supplies, how to sell farm products, and how to use credit profitably.

The rapid growth of agricultural extension and community development in recent years has been an important factor in increasing farm production in many countries. A well-planned programme of adult education is the most effective method yet devised to shorten the time-lag between the discovery of improved methods and their use on farms. However, technical assistance to farmers by such programmes does not reduce the need for improving the education of rural people. Reasonable progress can be made in teaching illiterate farmers how to improve present methods of production by well-planned demonstrations in spite of the tremendous difficulties and high costs of mass communication under these conditions. However, a *continuing programme* of agricultural development to meet the rising needs of a growing population at reasonable cost will require better educated farmers as an essential condition for success. The outstanding records of steadily increasing production made by the farmers of Japan and of Formosa give clear evidence of the advantages of education in applying scientific methods to farm operation.

RICARDO A. LETTS, *Lima, Peru*

In the first place I should like to state that I agree completely with Dr. Medici's and Dr. Myers's statements. Education is an instrument indispensable to economic development and to the strengthening of democracy in every country, especially in the under-developed countries with their large proportion of illiteracy. I should like to mention the situation in my country.

We have a very high percentage of illiterate people which prevents citizens from taking part in the country's political activities. For this reason only 15 per cent. of the people are qualified to elect a new government. Fewer than 2 million out of a population of 13 million are entitled to vote. The democracy is a deformed one.

As regards technical education the position is similar and has the same bad characteristics. In a predominantly agricultural country like

mine, where adequate modern techniques should provide a stimulus to agriculture and enable us to advance, we can hardly claim 2,000 agronomic engineers of whom only 400 are engaged in agricultural work. It has been proved that we need about 10,000 agronomic technicians simply to carry out the work of extension, so Dr. Myers is quite right in saying that this is one of the most serious obstacles to agrarian reform in the under-developed Latin American countries. But the position in my country is yet more serious, because the Agrarian University, formerly the National School of Agriculture, is dependent on a minute budget for teaching.

It is a State University and yet the State only provides 45 per cent. of the budget, and the School is expected to finance the remainder as best it can. It has two ways of doing this: one is to use the fields which are intended for experiments and demonstrations for commercial crops that are industrially profitable. Thus cotton claims most of the land that should be devoted to experiments and demonstrations. No consideration is given to the people engaged in the work, with the result that under the University, which should be a model of teaching, not only technically, but also socially, the workers live in sub-human conditions. The student who goes to learn about his work in the country discovers that it consists of exploiting people rather than land. Afterwards he goes to the country with a false sense of values, with the outlook of a wealthy plantation master—in short, with the outlook of an exploiter. This makes progress in agriculture very difficult.

This is one way. The other way of finding the necessary funds is through a periodical raising of tuition fees, which means that the lower classes are being excluded gradually from the possibility of receiving a technical education and broadening their knowledge.

Thus, education is being confined to those with the greatest purchasing power, to a class financially favoured. In this respect one is bound to acknowledge the obvious advantage of socialist systems where education is free. However, you can see what the situation is like in Peru, and it is the members of the Government who, through their negligence and callousness, are responsible for perpetuating this situation.

MERVIN G. SMITH, *Ohio State University, Columbus, Ohio, U.S.A.*

I believe even more emphasis should be given to Professor Medici's point that the limiting factor in development is human capital, especially in under-developed countries. In my opinion this factor has been greatly neglected and undervalued in planning and

stimulating economic growth. Most countries, including my own, have neglected it. We often forget that incomes per person tend to be related closely to productivity per person, and productivity depends greatly on education or know-how. People need both know-how and the economic structure through which they can use their full potential. In many cases we have tried to change the structure of agriculture but have failed to provide the people with education for operating effectively in the changed structure.

One example of this is agrarian reform. This is not likely to be successful unless the farmers who gain control of the land or have the new responsibilities have the new knowledge to manage a commercial farm operation. Another example is agricultural credit. Often we have assumed that the main problem for developing agriculture is the lack of capital or credit when the real problem is that the farmer does not know how to use credit and capital efficiently. In some cases more capital and credit would be accumulated and made available if it could be managed so well that farming would be a safe investment.

Another aspect of education which I wish to expand is that there are many different kinds, levels, and forms of education, and some attention should be given to all of them. I mean basic or fundamental education, specialized and technical education, and even re-education for jobs and skills to enable people to move to better jobs as changes take place. There are many other kinds and phases of education. We tend to neglect economic and social education for the masses of people. We agricultural economists need to do much more research on the economics of all kinds of education, especially as it relates to agricultural development. We do not know enough about the contribution of various kinds of education on agricultural development. If we knew more about the influence of education we could design agricultural policies that would realize the full potential of each individual and bring about much faster agricultural development.

F. C. TASSINARI, *Istituto di Economia e Politica Agraria dell'Universita, Pisa, Italy*

I am in agreement with Professor Medici but I would emphasize one point which, for me, is of some importance. I think it necessary to provide a different type of education according to the stage of economic development of a country. In a country close to starvation, vocational teaching in agriculture and the introduction of improved techniques increases production which will go almost entirely to

improve nutrition. But in countries at higher levels of development but with excessive agricultural populations, educational programmes should not be concerned only with improving agricultural techniques, but should aim at introducing vocational teaching in activities other than agriculture. This would greatly facilitate the transfer of population from agriculture to other sectors, which is an essential element of general economic development.

RAMÓN ARTEAGA PALLARES, *Banco Nacional de Credito Ejidal, Mexico*

The two addresses that have now been read have drawn my attention to a problem that arose in the Mexican Republic; in fact, in the Papaloapan region. If I am not digressing, I think this may come under the heading of education. It is not about educating young people but adults who were practising agriculture at subsistence level. It was thought desirable to make them change to a more developed form of agriculture. The largest dam in the Republic was constructed in the Papaloapan region and had a capacity of 8,000 million cubic metres, the area occupied by the reservoir being some 55,000 hectares. The population that lived there and whose lands had to be flooded came to about 3,000 heads of families with an average of five children each, which makes 15,000 people who had to leave. The Government organized a team of specialists in sociology, agronomy, civil engineering, &c., with the aim of creating new centres where these families could settle down. They were housed in eight municipalities in each of which different dialects were spoken. New roads were built in advance to give access to the urban centres and facilitate the transport of future agricultural produce. The centres were well planned with schools, houses, churches, a building to serve as Town hall, and on every piece of common land accommodation for the authorities—in short, all amenities were provided with no limit to the amount invested. Once the population had been moved, and after many difficulties had been surmounted, it was found that the families were leaving their new homes to settle once again in regions like those from which they had come. That is to say, they rejected the new way of life which was offered to them, preferring to return to their old ways. It is my opinion that this was a failure, and I should like to ask Professor Vanzetti for his views about its probable causes.

G. R. ALLEN, *Institute for Research in Agricultural Economics, University of Oxford, England.*

I fully understand why universal elementary and secondary education for rural citizens is socially desirable, but I cannot agree with

what Dr. Myers implies, namely that it has an overriding economic claim on scarce resources in under-developed countries. The case is certainly not proven that universal elementary and secondary education would stimulate technical progress in agriculture any more than, say, equivalent expenditure devoted to the *oral* dissemination of technical information bearing on agriculture. Dr. Myers's case would be much more convincing to me if there were no wireless. As it is, we have many illustrations in Africa of agricultures which have made extremely rapid progress with an illiterate peasantry.

This is not put forward as an argument against education as such, but is simply a claim that there are priorities even within education. Some countries probably cannot afford to develop all forms of education simultaneously and, in such cases, universal, indiscriminating, elementary, and secondary education may well represent a waste of scarce economic resources.

K. OHKAWA, *Economic Research Institute, Economic Planning Agency, Tokyo, Japan*

May I add some remarks on Japanese experience? It is true that universal education was developed widely in the initial stage of economic growth in Japan. Around the turn of the century, the proportion of boys and girls who graduated at primary schools was 90-95 per cent. of the total number of that age. This is a surprisingly high proportion, and it is natural that foreign scholars are apt to relate the speedy diffusion of universal education to our high rate of economic development. That the high rate of agricultural development is the result of education also has often been heard.

We Japanese agricultural economists have paid particular attention to this point, but it is difficult to reach agreement on it. I believe it is risky to speak about the effect of universal education on output or on productivity increases without having analytical results. There is no doubt that education is essential to invigorate the human element, but it is extremely difficult to single out its effect from those which stem from increased capital, labour, land, and technology. Education is best regarded as complementary with other relevant production factors. It is hardly appropriate for an economist to insist on the importance of education without first being sure that it really is a limiting factor in developing agriculture in a particular stage of a particular country. In this respect I agree with Mr. Allen that in discussing determinants of economic development, it is important to pay attention to priorities rather than to catalogue items of importance.

I should like to say a few words on a recent development of the study of the human element. Dr. Tang, under the influence of Professor Schultz, has recently investigated the development of Japanese agriculture with special reference to the effect of education. His econometric research seems to deserve attention, but I have some scepticism about its application to a practical issue. I do not deny the possibility of developing research of this kind in the future, but for the present we should be very wary of it.

D. PAARLBERG, *Purdue University, Lafayette, Indiana, U.S.A.*

I want to review briefly a case history involving education in an under-developed country—the United States of America a hundred years ago. We will celebrate this coming year, in 1962, the centennial of the land grant college system.

A hundred years ago President Lincoln signed into law a bill which set up a college in each State to provide education in agriculture and the mechanic arts. What has been our experience with this approach? At first it was very slow getting started. Education is a slow process. For the first several decades there was very little visible progress, but it grew, it became influential with the entire structure of our society. It has been even more influential, perhaps, in lifting American agriculture to its present high position. This success was made possible by several unique features, very useful to us in the United States, which may or may not be useful to other countries. Let me list them briefly.

First, it imparted to the farmer a status which he previously had not had, and which grew as this educational institution steadily advanced. The second feature of this system was, as Dr. Myers has said, that it associated research and extension with classroom teaching and the application of the new knowledge directly to the individual farm. Thirdly, it focused its efforts directly on the needs of the individual. It endeavoured to meet his problems as *he* saw them. This gave it a relevance and a status in the eyes of the individual operator which it otherwise would not have had. A fourth unique feature is that it was and is a co-operative system involving the individual student, the individual farmer, his local government, the State government and the Federal government. None of these could dominate the others. This institution has done a fine job for us. It has been uniquely successful.

The land grant colleges have been re-naming themselves universities in recognition of their wider responsibilities and opportunities,

having entered a new dimension of public service. This point has been made here and at the meetings of the American Farm Economic Association at Fort Collins, Colorado. The land grant colleges are recognizing their responsibility and opportunity to extend their knowledge across the seas to the under-developed countries. We in our own development borrowed knowledge from the already established countries in Europe. In turn we now extend our knowledge to the new developing countries.

It is true that our educational system, and the fruits of that system, must be adapted rather than adopted. They must be modified as they are applied. Our circumstances differ from those of other countries. But I believe that the developing science and knowledge that we have accumulated in these one hundred years is, perhaps, the most helpful thing that we have to offer the nations abroad. It certainly helped the United States to advance from being an under-developed to being a developed country. I think it will work for other nations as well.

W. E. CAVE, *Everleigh, Wiltshire, England*

As probably the only uneducated member of the Conference, I have considerable doubts whether so much education is of great advantage to a farmer. I do not feel that education is of benefit to the individual, though I certainly feel the lack of education myself. But looking around the south of England where I live, I see no evidence that the successful farmers are those who have been better educated. I do feel that a certain type of education is very necessary; a farmer should be able to read and write, and sometimes it is a good thing to be able to do arithmetic. But looking around my fellow farmers I cannot see that a technical training has been a conspicuous advantage to those that have had it. I have been particularly struck throughout this discussion and in the paper itself by the assertion that education is necessary to make a farmer susceptible to technical change. I do not think that is so at all. Technical change reaches farmers very largely through demonstrations which take place at farm level. I think it would be of great benefit if there were more objective study done to find out if so much education is really necessary to farming communities.

W. I. MYERS (*in reply*)

In addition to certain details, some of which I think were important, I tried to make two points concerning long-term, continuing agri-

cultural development. One is the importance of developing agricultural research, teaching, and extension. I made the point that you cannot import new techniques ready to be applied. To be economically profitable, they have first to be demonstrated on farms in each important region of the country concerned. This means that in every developing country high priority should be given to an agricultural institution for providing research, education, and extension which should be closely integrated.

I believe also that in a programme which looks for continuously rising productivity over a long period of years (keeping ahead, if possible, of rises in population) universal education is an essential factor. I would certainly agree with Mr. Allen that priorities have to be established and that a relatively poor under-developed country could not establish universal education at once. We should have to catalogue the more desirable things in order to establish the priorities. Some of them relate to agricultural development and economic growth. There have been many cases where countries could not develop agriculturally through failing to give enough consideration to universal elementary education. The tendency to give too much consideration to modern scientific equipment has impaired the ability of those countries to achieve more rapid economic and agricultural progress.

On Mr. Cave's point I know good farmers who had only elementary education and I know men who have obtained doctors' degrees and who are very successful farmers. I would certainly take for granted that education is only one of the factors, though I would say one of the important factors, that affect the success of the individual farmer. I believe, however, that the levels of education needed for successful farming in any country are rising. With the increase in technology farmers will have to be better educated in the years ahead for reasonable success for themselves and for their countries.

C. VANZETTI (*in reply*)

What Professor Myers said about the financial problems involved in education seems to me appropriate because there are no limits, theoretically, to the extent of education. The limits are determined only by the financial possibilities of the community or state.

Professor Myers mentioned experimental farms, and Professor Medici pointed out their advantages particularly when they are close to the schools. But extension work is not done in the schools but must be developed with the farmers. It is very important for those

of the active population who cannot go to the schools but only receive instruction of a vocational type. I remember seeing the positive results achieved in the area of the Tennessee Valley Authority, where private farms were used for experimental purposes.

I think we should reconsider connexion between general and vocational education. They should not be thought of as separate types of education, because in a certain sense they are complementary. In some cases it will be necessary to emphasize general education, in others vocational education. One must take account of the age of the farmers and of the people to be instructed. For general education, dealing with young men, it is possible to give some vocational instruction and education. For the older people it is difficult to give general education; it is easier to begin with experimental work, and to give some vocational education, based mostly on discussions, as opportunity arises.

The example of the Papaloapan region has been quoted. The new opportunities opened up there by providing new houses and villages were abandoned when the farmers returned to the primitive life. This was a result, probably, of not giving them the necessary education. There should have been discussions and elementary instruction to convince the farmers that it would be possible for them to have better standards of living if they were properly instructed in the technical side of their work. Both general and vocational education are needed, but the emphasis on the one or the other should be varied according to the particular conditions.

(2) THE SOCIOLOGICAL ENVIRONMENT

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ONE of the least well developed sectors of sociology is still economic sociology. When one looks at the leading journals in this field, one sees that the number of articles devoted to economic behaviour is, relatively, extremely small, though every sociologist will acknowledge that economic behaviour is a very important part of social behaviour as a whole. This does not mean that amongst the enormous quantity of sociological literature which has been written, especially during the last few decades, economic sociological publications are totally lacking. Taken together, many bookshelves could

be filled by books and articles on subjects related to economic sociology. But that does not alter the facts that the contacts of sociologists with economic life are rather incidental, and that economic sociology has not yet achieved the same status in sociology as a whole as have many other branches of this science.¹ An exception has perhaps to be made for so-called industrial sociology, a rather specialized and narrow branch of sociology, which is not at all a sociology of economic life in an industrialized society, as its name promises, but only the sociology of industrial enterprise.²

The best situation we find probably in rural sociology. Most of this developed within institutes for higher education and research devoted to the furtherance and development of agriculture as an economic activity. So rural sociology could hardly avoid economic behaviour, and though this science has developed to a sociology of rural life in general, interest in economic behaviour as a part of social behaviour is almost general with rural sociologists. On the other hand, rural sociology is a part, and a rather young and relatively small part, of sociology as a whole, and it has not yet been able to compensate for the shortcomings of sociology in general in the field of economic sociology.

This means in this concrete case that there is not yet a well developed, more or less generally accepted, body of theory of the sociological conditions of economic growth. When I try to give here an outline of what is the important sociological background of this economic development, you have to bear in mind that much of what I say is still hypothetical or needs at least further confirmation.

Sociologists can look at economic growth from many points of view, all of which are interesting and of importance for the understanding of the phenomenon. We can be interested in economic growth in relation to leadership, to social stratification, to type of family life, to urbanization, and so on. It seems to me that the most essential and embracing sociological problem related to the phenomenon of economic growth is that of social change. That there exists a relation between economic development and social change no one will deny. But not all relations between economic development and social change are of importance with regard to our subject. The fact that economic growth as a rule leads to changes in other spheres of social life offers a number of interesting sociological problems, but

¹ An example of a recent textbook in which adequate attention is given to economic sociological problems is H. M. Johnson, *Sociology*, 1960.

² For some remarks on the difference in character of industrial sociology and rural sociology see: E. W. Hofstee, 'Agriculture and Rural Life in an Industrialising Society', *Transactions of the Fourth World Congress of Sociology*, vol. ii, 1959, pp. 13-28.

to follow them up would not help us very much to understand the sociological *conditions* for economic growth.

We come nearer to understanding the fundamental importance of these conditions when we appreciate that economic development *is* always social change in the sense of change in the social relations between the human beings involved, change in their culture, and change in their behaviour as it is conditioned by social structure and culture. When a group of subsistence farmers begin to increase their production, begin to specialize, and begin to sell their products in the market, then this process not only *leads* to social change but *is* social change. It means entering into relations directly or indirectly with people outside their village whom they have considered till now, perhaps, as foreigners and whom they have probably distrusted. It means perhaps taking credit to finance the expanded business. And that again means, as facts show, a fundamental change in the way of thinking of the peasant because, traditionally, he considered loans as essentially wrong. It means perhaps that co-operatives have to be established to sell the products and to buy commodities which the peasant needs in the new conditions. It means perhaps change in the organization of the labour force working on the farm. It means certainly the abolition of a number of customs which, traditionally, played an important role in the life of the farmers individually and in the community as a whole. It means also the necessity to make calculations which the subsistence-farmer never did before.

Not all economic development implies equally important social change, of course. When for example the population increases in a region where abundant land of good quality is available, this will perhaps lead only to an increase of the acreage of cultivated land, without changes of importance in the system of production and without change of importance in social life in general in which this system of production is embedded. But such cases are rare. It is also possible for economic growth to develop so very slowly that it is almost imperceptible and the change in social life involved is not recognized as such by the population.

But economic growth as it has occurred in agriculture in the more highly developed countries in the last seventy-five years or longer, and as considered necessary at the moment in the so-called under-developed countries or under-developed regions, is part of, and cannot exist without, a rapid and complex process of social change of which, just because of its speed, most of the population must be conscious.

This leads to the conclusion that for economic growth of any

importance it is essential that the population in question be willing to accept social change. This holds for agriculture, at least for agriculture in the non-communist countries, even more than for industry. In industry economic development is for the greater part dependent on the willingness to accept change of a rather small number of people at the top of the concerns, though the willingness in this respect of the labourers is certainly not without importance. But in agriculture this willingness has to penetrate the minds of a multitude of farmers and peasants before it can influence the economic behaviour of the population as a whole.

Numerous investigations made during the last few decades by rural sociologists have shown again and again that the greatest obstacle to the development of agriculture originates from the fact that so many farmers are not willing to accept the change in their individual and their group life which is an unavoidable condition for this development.¹ This often occurs even in cases where the agricultural population is well aware of the attractions of a higher standard of living in the modern world and would like to share it.

Even in the most highly developed countries a great number of farmers resist the social change necessary for economic development, or at least are very reluctant to accept it. In some of these countries there are still regions where hardly any development of agriculture is perceivable, though all necessary information about modern agriculture is easily available and the government and private organizations do their utmost to bring agriculture up to a higher level.²

¹ See the many publications of American rural sociologists on the adoption of new farm practices. Most of these publications are mentioned in the recent *Bibliography of Research on Social Factors in the Adoption of Farm Practices*, 2nd edition, Iowa State College, 1959. Also several publications of the Department of Rural Sociology of the Agricultural University of Wageningen (Netherlands), as, for example, A. W. van den Ban, *Enkele kenmerken en eigenschappen van vooruitstrevende boeren*, Part I, Bulletin No. 5, 1957, and Part II, Bulletin No. 10, 1958, of the Department of Rural Sociology, Wageningen; E. Abma, *Boer en coöperatie in Nederland*, Part I, Bulletin No. 2, 1955, and Part II, Bulletin No. 12, 1958, of the Department of Rural Sociology, Wageningen; A. J. Wichers, *De beoefening van de bloemisterij en de groenteteelt te Beesd*, Bulletin No. 3, 1957, of the Department of Rural Sociology, Wageningen; E. W. Hofstee, *Sociologische aspecten van de landbouwvoorlichting*, Bulletin No. 1, 1953, of the Department of Rural Sociology, Wageningen; A. W. van den Ban, 'Locality Group Differences in the Adoption of New Farm Practices', *Rural Sociology*, vol. xxv, pp. 308-20; B. Benvenuti, *Farming in Cultural Change*. In Germany interesting research was done by von Blanckenburg (P. von Blanckenburg, *Bäuerliche Wirtschaftsführung im Kraftfeld der sozialen Umwelt*, Schriftenreihe für ländliche Sozialfragen, Heft 26, 1960), in France by Mendras (H. Mendras, *Attitudes des agriculteurs du Smâgou vis à vis de la modernisation de l'agriculture, 1959*). In India Bose has started research in this field (S. P. Bose, *Characteristics of Farmers who Adopt Recommended Agricultural Practices in Some Selected Villages in West Bengal, 1959* (mimeographed)).

² A typical example of a traditionalistic rural community in Italy is given by Moss and

To understand why this is so one has to bear in mind that in human society social change is abnormal. For ages mankind lived in a world which hardly showed any change at all or at least not a change which was consciously experienced as such. It is true that several civilizations in the past rose to such a level that social life showed a much quicker change than was normal in the surrounding world. But it is only in our modern world, since the end of the eighteenth century, that social change has become an important element in the daily life of the population and that people have become conscious of the fact that the world is a changing one.

Change as such is important, but perhaps even more important from our present point of view is the attitude towards change. Man's outlook on life has been almost always a traditional one. The norms for human behaviour were found in the past. Things had to be as they always had been. What was done by the past generations was well done and should be done by the future ones. This attitude was expressed and symbolized by the great power and the dominating influence of the old people in almost all past civilizations. Even in traditionalistic societies sometimes change was unavoidable. But in that case those who had to convince the population of the necessity of this change mostly preferred not to present it as innovation and improvement and not even as a change but as a return to old customs and conditions which, for unhappy reasons, had been lost. Perhaps in a very few of the civilizations of the past, especially in the Greek civilization in its heyday, there was a beginning of a revolt against traditionalism, but it was only in modern civilization that it lost its dominant power in society. It is only in the last two hundred years that people have learned more and more to accept change as something which is essentially necessary for the well-being of the individual and of society. In modern society we may differ as to the kind of change which is most desirable and as to the degree of change and the speed at which it should be realized, but the conviction that change is not only unavoidable but that it is a way of improving our living conditions has become ever more general. Our society has become really dynamic in the sense that change has become normal and—how paradoxical it may sound—part of the routine of our daily life.

In my opinion the acceptance of change as normal and as right in principle is the most essential characteristic of modern culture.¹ It is

Cappannari in their study of a village in southern Italy (L. W. Moss and S. C. Cappannari, *A Sociological and Anthropological Investigation of an Italian Rural Community*, 1959 (mimeographed)).

¹ This does not mean, of course, that all non-modern societies are alike. But from the

the root of almost all other characteristics of this modern culture and makes it clearly distinct from all other cultures, present and past. It is, I believe, more essential than other phenomena which are sometimes used to characterize modern society, such as capitalism, industrialization, urbanization, and rationalism. Part of these phenomena are only aspects of this acceptance of change, part of them are its consequences or are dependent on it to a high degree for their existence. It penetrates all material and non-material aspects of modern culture. Our modern culture is perhaps best indicated by the word *dynamic*.

The first clear symptoms of this modern revolt against traditionalism we find in Italy in the Renaissance. For a long time this non-traditionalistic way of thinking was shared only by a small group of intellectuals and a few exceptional men in trade and government. Their influence was important, but they were not representative of the society as a whole. It is only in the second half of the eighteenth century that it begins to penetrate the minds of a great number of the members of the middle class, especially of the upper middle class, in several west European countries. From the upper middle class this new way of thinking reached the lower classes in course of time. The modern dynamic pattern of culture is now dominating our society, but in fact the process of its gradual acceptance is still under way. Not even in the more highly developed countries is it accepted everywhere and by everyone. Even in the most advanced countries remnants of traditionalism are still to be found.

In general the modern pattern of culture reached the countryside rather late. This was not only, and perhaps not even primarily, a consequence of geographical isolation. In some parts of Europe, where a class of well-to-do, large farmers existed in the eighteenth century, we find an early development of modern ways of thinking, in some cases as far back as that century.¹ But the majority of the agricultural population did not consist of well-to-do, self-assured farmers but of poor, modest, self-contained peasants who belonged to the least privileged classes in society. They, as well as other social groups on the lower rungs of the social ladder, came rather late into contact with this modern dynamic Western culture. For a great part, probably by far the greatest part of the countryside in the Western world, this process of acceptance of the modern pattern of culture began

point of view which is interesting us here, it is not necessary to differentiate the various types of traditionalistic society as for example between folk societies and peasant societies.

¹ For an example of a rural society where a modern mentality came into being in the eighteenth century, see E. W. Hofstee, *Het Oldambt, Deel I, Vormende Krachten*, 1937.

only at the end of the nineteenth century. There it is not yet complete, often far from complete. In the so-called under-developed countries it has hardly begun. The struggle between the traditionalistic and the modern dynamic culture in my opinion is almost everywhere the most important feature of social life in the countryside. It is the most essential element of what is often called the modernization or urbanization of the rural areas. The term urbanization, I believe, is not quite right, because the modern dynamic culture is not typically urban, even if it was generally, though not always, accepted earlier in the towns and cities in a certain region than in the countryside. It is important to point out that there are not only regions which are relatively traditionalistic and other regions which are relatively modern but that in every region we find farmers on different levels in a continuum running from traditionalistic to truly dynamic. Even in a country where change as a means to improvement is so widely accepted as in the United States of America, farmers in a certain region show remarkable differences in their willingness to accept change, as appears clearly in research findings. But there are very important differences between the various countries and regions as a whole so far as their places in the continuum are concerned.¹

Summarizing the reasons I have set out, our conclusion is that economic development in agriculture depends to a high degree on the willingness of the farmer to accept change, that in any concrete case this is dependent on his attitude towards change in general, that this attitude is determined for the greater part by the degree to which he has accepted the modern pattern of culture, and that a favourable attitude towards change is even the most essential characteristic of this modern, as opposed to the traditional, culture.

That the inclination to consider change as good in principle and as necessary for the improvement of the well-being of the individual and of society is the most essential element in modern culture, is not a conclusion which can be sustained by exact evidence of course; it is partly a question of subjective valuation and is open for discussion. But the rest of the conclusions can be corroborated, I believe, by facts and figures.

As I have mentioned already, numerous investigations have shown that successful farming and therefore economic development in agriculture is highly dependent on the willingness of the farmer to

¹ The concept of a continuum running from traditionalistic to modern-dynamic was clearly developed by B. Benvenuti in his study of the community of Winterswijk in the Netherlands (B. Benvenuti, *Farming in Cultural Change*).

accept change. These investigations have shown also that this willingness was not just an accidental, more or less independent, trait of the individual mind, but that it was clearly related to the social and cultural conditions under which the farmer was educated and under which he lived. The majority of the studies in this field have been carried out in the United States of America. Several rural sociologists in that country have tried to bring under a general heading—as, for example, the degree of urbanization, or the degree of rationalization¹—the conditions which favoured the development of a positive attitude to change and, because of that, favoured successful farming. One of the first American studies in this field emphasized the importance of the general cultural background of a certain group of farmers for the acceptance of certain new farm practices.² Nevertheless it is remarkable that American rural sociologists have not tried, or have seldom tried, to correlate the willingness to accept technical change in agriculture with the degree to which the farmer participates in the essential aspects of modern dynamic culture.³ But it seems to me that the findings of the American rural sociologists fit into the conception that the willingness to accept change, including technical change, is part of a general pattern of culture of which the positive attitude towards change is probably the most essential element and which penetrates all sectors of human life.

In a number of investigations carried out by the Department of Rural Sociology of the Agricultural University of Wageningen we have used a direct cultural approach, so far successfully. It has proved possible to indicate by a simple scale the place of the farmers in the communities we have investigated in a continuum running from traditionalistic to modern dynamic. It can be shown that the farmers who scored low in this scale are characterized by cultural traits quite different from those characteristic for the farmers who scored high. The totality of the cultural traits we found with the

¹ Interesting is the study of Dean *et al.* in which the authors tried to introduce rationality as an intervening variable between a number of independent variables and the adoption of new farm practices (A. Dean, H. A. Aurbach, and C. P. Marsh, 'Some Factors Related to Rationality in Decision Making among Farm Operators', *Rural Sociology*, vol. xxiii, pp. 121-35).

² C. R. Hoffer, *Acceptance of Approved Farm Practices among Farmers of Dutch Descent*, Michigan Agricultural Experiment Station Special Bulletin 316, 1942.

³ Near to a cultural approach comes H. L. Campbell. He tries to relate the use of information sources to some personal and social variables. He uses as a theoretical model for his study the so-called localite-cosmopolite model. The localite-cosmopolite dichotomy is related to Tönnies' *Gemeinschaft-Gesellschaft* dichotomy and several other concepts of that kind. It has some relation also to our traditionalistic-dynamic continuum. H. L. Campbell, *Factors Related to Differential Use of Information Sources*, Rural Sociology Report No. 10, Iowa State University, 1959.

sub-group of the farmers who scored low on the one hand and that for those with a high score on the other hand were clearly consistent wholes from a socio-psychological point of view. This confirmed not only that traditionalistic and modern farmers show different cultural traits, but that those different traits form real patterns, even if the transition from one pattern to the other is gradual.¹

These different patterns are correlated with quite different types of social behaviour, including economic behaviour. It is impossible to give here a complete picture of the differences in economic behaviour which we found. The modern dynamic farmers were far ahead of the traditionalistic. In one community we divided the farmers into three groups according to their score in the scale we used to measure their place in the continuum from traditionalistic to modern. We found that, other conditions like size of farm, &c., being the same, the group showing the highest score earned a yearly income about 30 or 40 per cent. higher than the lowest score. But even more important is it that, without the modern dynamic sub-group in the community, there would be hardly any economic development. They are the innovators, who after some time are followed slowly by the traditionalistic farmers. Our findings do not, of course, yet allow world-wide generalizations. But as I have mentioned already, it seems to me that the results of the findings in other countries agree with our results.

The next step, of course, and from the practical point of view the most important one, is to find out why farmers are modern or traditionalistic. Up to now our findings do not suggest that inborn qualities are of great importance in this respect. The findings in other countries with regard to the acceptance of new farm practices seem to corroborate this conclusion. This means that the degree to which the modern pattern of culture has penetrated certain regions and communities and certain sub-groups in these regions and communi-

¹ That a certain pattern of culture is characteristic for modern farmers does not mean, of course, that they are all alike and behave alike. Modernism is only a part—be it an important part—of the personality of the individual. Besides, modern farmers can live under different conditions and that means also that their behaviour can vary. Therefore not all cultural traits which are related to the modern pattern of culture will be equally strong with all individuals who can be classified as modern. But when we compare *groups* of modern farmers there appears, so far as our experience goes, a basic similarity in the pattern of culture of the groups as a whole. When Menzel *et al.* (H. Menzel, J. Coleman, and E. Katz, 'Dimensions of Being "Modern" in Medical Practice', *Journal of Chronic Diseases*, vol. ix, pp. 20-40) find four distinct dimensions of being modern in medical practice, this does not mean that there is not one modern pattern of culture, but that on the basis of this one underlying pattern of culture different ways of modern behaviour can develop and that it is possible to distinguish certain types in these different kinds of behaviour.

ties is dependent on the degree to which they are open to cultural influences from the outside. For even if it would not be right to consider those who accept modern culture as only passive, the primary influences from which originates the modern way of thinking of our farmers come from outside.

One of the most outstanding characteristics of the modern dynamic farmers as compared with the traditionalistic farmers, according to our findings, is the great interest in what happens in the world outside their farms and outside their communities. They have their own standpoint with regard to things which matter in this outside world, while the traditionalistic farmer when asked about these problems will tend to answer: 'I do not know'.

But what are the conditions which help or hamper the penetration of cultural influences from the outside? Basically it is a question of the degree of socio-cultural isolation. What, then, causes and what prevents isolation? Future research will give us a better insight in this respect, but some provisional partly obvious conclusions can already be drawn. The degree of geographical isolation is important. Even in modern countries which as a whole are opened up for modern transport, local differences in quality and quantity of roads cannot be neglected. So we found in a rural community in the Netherlands, a significant correlation between the degree to which the modern pattern of culture had been accepted and the distances from the farms to the metalled road.¹ It is hardly necessary to stress the importance of the means of transport and communication. Modern transport and modern means of mass communication are now threatening traditionalism in all parts of the world. Important also is the degree of education taken in the widest sense. Though not all investigations show the same results, it seems that general education is of special importance and that the role of formal technical education in agriculture should not be over-estimated.

More interesting from the sociological point of view are the causes of the continuation of traditionalism which have to do with the less obvious characteristics of social groups in question. Very important are the attitudes of the population towards outsiders and especially towards the government and its representatives. In peasant communities there is often a strong distrust of outsiders but the degree of this distrust and the chance to break it down depend very much on the character of the government, the state of public affairs and public morals in general, including the morals in trade and commerce.

¹ Benvenuti, *op. cit.*

Bad government past and present greatly hampers the acceptance of modern ideas by the farmers.¹

The type of social structure is also of influence. Strong class and caste differences, and the resulting lack of communication between the higher—who are normally the first to accept the modern pattern of culture—and the lower may retard the movement. Small farmers often have the feeling that modernization of farming is something for the 'big ones' and that it would be unsuitable if they tried to imitate them.²

Self-created socio-cultural isolation of small groups, for example sectarian groups, may lead to non-acceptance of the modern pattern of culture. It seems to depend partly on the size of the group. If it is large enough to have sufficient competent social and intellectual leaders they will often modify the modern pattern of culture to suit their own needs so that it will be acceptable for the members of the group. But when the group is small, the members often consider any symptom of a changing culture which they perceive in outsiders as wrong.

Haller's investigations lead to the conclusion that a firm conviction of farmers' sons that they want to become farmers often causes a certain cultural isolation and a more traditionalistic frame of mind.³ His findings are corroborated to some extent by our own. Modern

¹ It seems an acceptable hypothesis that the extreme backwardness of agriculture and the resistance against change in southern Italy and some parts of Ireland is caused, at least partly, by a deep distrust of government agencies in the past.

² See, for example, H. Mendras, *Pour une analyse compréhensive de la diffusion du progrès agricole*, 1959, mimeographed. A. K. Constandse, 'Sociale hiërarchie in Kamerik', *Mens en Maatschappij*, vol. xxix, pp. 293-307 and 342-62, showed that in a seemingly fairly homogeneous rural community there were almost no informal relations between groups of farmers of different social prestige.

³ A. O. Haller, 'The Occupational Achievement Process of Farm-Reared Youth in Urban Industrial Society', *Rural Sociology*, vol. xxv, pp. 321-33. Haller shows that farmers' sons who plan to become farmers have a lower level of educational and occupational aspiration than those who plan to find jobs outside agriculture. They show a lack of interest in extended education and in information about the outside urban-industrial world in general. There is a suggestion in Haller's paper that the mentality of those who plan to farm is to be considered as a right adjustment to a future life as a farmer. He quotes Strauss, who remarks that those who plan to farm have values functionally useful to farming. I doubt if this is right. Several of the characteristics Haller finds for the boys who plan to become farmers are the same we find for traditionalistic farmers. Modern dynamic farmers—which means from the economic point of view, good, successful farmers—show, for example, a great interest in the world outside their own community, including non-agricultural affairs. As a rule, too, they are interested in extended education for their children. In his study of the Dutch community of Dantumadeel A. Bergsma found that sons of modern dynamic farmers, who resemble Haller's boys who are planning to find non-agricultural jobs, are usually successful in non-agricultural occupations, while sons of traditionalistic farmers, who resemble Haller's boys who plan to farm, are as a rule not successful.

farmers consider it normal that a man should try to find another job when he cannot earn a decent living in agriculture and they do not consider it self-evident that their children should become farmers.

In the foregoing only a few factors which influence the development of a modern pattern of culture as affecting farmers are discussed. More could be mentioned and future research will reveal still more. I have emphasized the significance of the degree of acceptance of the modern pattern of culture for economic development in agriculture. This does not mean, of course, that there are no other sociological factors of importance, nor that this factor will have the same importance in the future as it has now. But it seems to me that in the present situation the most valuable contribution rural sociology can make to economic development in agriculture is to identify the social conditions in the countryside which are hampering the development of the modern dynamic pattern of culture, and the means necessary to change these conditions, so far as this is possible and desirable.

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I shall open the discussion by attempting three things: a brief note of Professor Hofstee's main points, a few comments on his points (some assessment of what he has included and what he has left out), and an indication of the main lines along which I think gaps may be filled.

Professor Hofstee approaches the topic with two main ideas and one basic question.

Firstly, he says, economic development in agriculture depends on farmers having a willingness for change—in fact they have to accept change not only as a good thing but as a routine aspect of life. Then they are the modern dynamic farmers and no longer traditionalistic ones. Secondly, he believes that change is abnormal in human society which has a basic tendency towards traditionalism.

Professor Hofstee's fundamental question, therefore, is, what hampers the metamorphosis of a society from the traditional state to that of the modern dynamic. I hope I have put the essence of his view fairly. I believe his approach is adequate for certain purposes and it is not unsound provided we realize the limitations involved.

In commenting on the adequacy or otherwise of the paper we should examine the criteria that have been adopted for including certain topics and for excluding others. Professor Hofstee has

concentrated his attention on studies about the individual characteristics of dynamic farmers as compared with backward farmers in certain countries. I am sure the research referred to was all done most meticulously. In fact, you may be aware of the wonderfully careful inquiries that correlate, with fantastic formulas, the number of pages of catalogues a farmer reads per annum with the yield of sweet peas on his farm; or the brilliant discovery that there is a close statistical relationship between high-income farmers and those who know that Mikoyan is not a make of camera. No doubt such studies have their places in the universality of knowledge.

Whatever other considerations there may be, such studies cannot be valid for generalizations about conditions which belong to another dimension. In fact, most of these studies and many similar studies known to me have been made in countries such as the United States of America and the Netherlands. There are very few studies of this type that have been made in the developing countries. It would be unsound therefore to aggregate, to project or to generalize conclusions from such studies into statements about conditions in the developing countries. It would be wrong because the developing countries are so different in many basic aspects—economically, politically, institutionally, socially, and so on. In fact they are so different that we must put them in another dimension. And you are beginning to be shocked by some of the fundamental differences between these two dimensions.

First, there is the poverty. The main characteristic of this is extremely unequal distribution of income with an increasing gap between the high- and the low-income groups. Secondly, there is the non-existence of a functioning Welfare State; there are no price supports, no parity price schemes, no subsidies, no import restrictions protecting agriculture, not more than 5 per cent. of rural credit comes from State or co-operative sources, there is no large-scale State or co-operative agricultural marketing agency. Instead, there is exploitation by monopolistic traders, rent-racking landlords who take half or more of the crop, money-lenders who charge upwards of 100 per cent. rate of interest. Thirdly, health and sanitary facilities are highly inadequate: one doctor to 20,000 of the population, quasi-starvation and debilitating diseases which are routine, facilities for education which are very inadequate, and education which at best is primary and often theologically biased. Fourthly, developing countries are either still fighting colonialism or have just emerged into nationhood and the major attention of *élites* and populace alike, therefore, is towards nationalism, often with chauvinistic tendencies.

One should not forget also the friendly nations among the modern dynamic states which sometimes deliberately support leaders or governments that are conservative, reactionary, or traditionalist.

In the last few days you have heard quite a lot about souls and minds. Do you realize that the impact of Western cultures, often colonialist, can be utterly soul-destroying? For example, the imposition of Western land-tenure systems on native systems can lead to large-scale loss of indigenous land ownership to foreign traders and money-lenders as well as to foreign plantation owners.

The abrupt imposition of a money economy on a society that lives at subsistence level and trades by barter can have disrupting effects that may persist through several generations. Worse still, in their greed for raw materials, the colonialists (if they cannot enslave the natives because they are too proud to be cowed into becoming coolies or because they are not interested in the way of life of a plantation worker) bring in migrants. These migrants come from societies where money has been in use for centuries and where a cash-price market system is normal. The interaction of two such groups, the sophisticated monetized and the simple non-monetized, under the benevolent aegis of the colonial power will have the kind of results we see in south-east Asia today. Why are the Chinese village capitalists and the Indian money-lenders so unpopular in south-east Asia today? Why is it that all governments in the region are adopting policies which restrict their activities? These are vital questions for economists and sociologists interested in rural economic institutions.

Fifthly, although the notion of full employment is enshrined in the United Nations Declaration of Human Rights as well as in the United Nations Charter, it can only be practised, apparently, in high-income societies. The realities for developing countries are under-employment, disguised unemployment, and a high rate of urban unemployment.

These are some of the major socio-economic differences between the developed and the developing countries. If we are blind to these differences, it is inevitable that we shall fail to understand the processes of change in agriculture or in the rural sectors of developing countries.

Let me conclude, therefore, by making some suggestions for supplementing the gaps. Firstly, what are the social or socio-economic institutions that hamper economic development? For example, can we agree with Professor Hofstee that, traditionally, the peasant considers loans as essentially wrong? What peasant in what period following what religion is he referring to? For example, this is not true

for much of south-east Asia where it has been shown that gifts are in fact recognized as long-term loans. I am personally aware of many words in the languages of the region which are used for borrowing goods or labour or money, and none of which has a perjorative sense. Let us not project the protestant ethic into Asia and Africa. In fact, what we need for the vast Muslim area between Morocco and Indonesia are studies about the effect of religious attitudes regarding interest in Islam and the various interpretations and rationalizations that have been adopted to meet the needs of credit instrumentalities in the modern State.

What are the social consequences of uncontrolled landlordism, exploitative trading and usurious money-lending, quite apart from their economic consequences? I would like to ask, does Professor Hofstee really believe that a peasant tenant farmer who has no security of tenure and who has to pay his landlord half of the crop plus gifts—does he think such a farmer would react in the modern dynamic mode towards the use of fertilizers, modern fencing, or irrigation techniques in the same way as farmers do in America or England where the Government looks after them at every turn? I suggest that the south-east Asian farmer could more easily believe in space travel, cosmonauts, and Vostoks I and II than the parity price system of the U.S.A. or even the tenancy protection laws of the United Kingdom. These institutions would sound more like social science fiction to him. In the developed countries agriculture functions in a welfare-orientated infrastructure, whereas in a developing country the rural economy is chained to an infrastructure that is orientated towards exploitation.

What about the willingness to accept change? It is often postulated that agricultural development cannot be achieved because the peasants are unwilling to adopt changes even when they have the resources to adopt such changes. How much real on-the-spot sociological, economic, political, and psychological investigation has been done to ascertain the veracity of this theme? As one who lives in a developing society, it seems to me that the evidence shows that, given the opportunity, people—rural people especially—want to change. If they can really get hold of something concrete and if they are convinced it will improve their way of life, then they will adopt it. For example, consider the spread of the bicycle, the sewing-machine, patent medicines, the kerosene stove, outboard motors in the fishing industry and nylon nets; the introduction of new crops like rubber and oil palm. (In fact, it was the imperialistic governments that had to restrict the peasants in south-east Asia from

further cultivation of rubber.) Consider the demand for education at all levels in Asia and Africa. Is there an empty rural or urban school, or empty university lecture room?

Finally, while I agree that the members of the modern dynamic society are willing and desirous of change all the time, I invite Professor Hofstee to look at the affluent society, which sociologically is the most advanced of the modern dynamic types. I would like to know his opinion about conformity. What about the organization man? What about the other directed man in the 'lonely crowd'? Is the acme of the modern dynamic mode bland living in a grey flannel suit? With mass production and mass consumption, not to mention agricultural surpluses, industrial waste, and planned obsolescence, farmers find buckles behind their trousers whether they want them or can use them or not. They crave for a democratic, non-alcoholic beer, tobacco that tastes different, that contains anything but real tobacco. They have the benefit of newly planned anxieties like halitosis, baldness, or even unmanliness. Of course, these are great changes from bygone generations, and if they are essential characteristics of the modern dynamic society then let me abide with the traditionalists.

PAOLO MARIA GAJO, *Istituto di Economia ed Estimo Forestale, Florence, Italy*

Mr. Hofstee points out that in certain conditions a collective change of mentality is necessary for agricultural development. Two examples which prove this are land consolidation and co-operation. Neither of these raises any difficulty from a technical point of view, but both come up against serious obstacles owing to collective psychological prejudices. Both in France and in Italy it has been found that the most important obstacle to economic development in certain social situations is a sort of diffidence or even mistrust that people feel in themselves and in others. This is in spite of the fact that they acknowledge the necessity for change and the advantages to be derived from it. The economic development of the region in such cases is strictly dependent on a collective change of mentality. There is a similar need to discard mistrust in order to develop co-operation, especially in regions of small family holdings. In the context of the economic and social conditions of western Europe these are considerations of basic importance for dynamic evolution. The basic problem is educational in the sense that communities should acquire realistic views and show themselves willing to face the sacrifices that are connected with these necessary changes.

C. BARBERIS, *Istituto Nazionale di Economia Agraria, Rome, Italy*

On the first day of the Conference Professor Vanzetti emphasized the importance of a strictly economic point of view in inquiries into auto-consumption. After the paper on the sociological problem by Professor Hofstee, I think that a deeper study of the sociological aspect is also necessary. It is clear in fact, that there is a close interdependence between auto-consumption and illiteracy, between lack of markets and lack of knowledge.

H. DE FARCY, *Vanves, France*

Professor Hofstee's paper and Professor Aziz's reply do not sufficiently emphasize a fundamental question. They agree on the need for changes but do not throw sufficient light on the problem of who is going to initiate the changes. It is known that industry and trade have been transformed lately by the institution of schools of management; these have taught the middle and higher executives, not the big directors, how to take the initiative. On the whole, we have good agricultural schooling with the highest qualifications from an academic point of view. Young people are taught to inquire into the deepest causes of phenomena, and are given a good scientific education. But in many cases they are not shown the method or given the incentive necessary for them to be able to change anything in the field of their responsibilities. The time has come for higher agricultural education in most countries to model itself more than it does on the schools of management. More opportunity should be given, not only to the study of projects, but to participation in projects. Not only professors, but men of action should be called in to give instruction. This, I think, is *the* condition for really helping the leaders of countries, whether developed or not, to undertake the responsibilities on which the development of their countries depends.

H. A. OLUWASANMI, *University College, Ibadan, Nigeria*

I want to suggest to Professor Hofstee that, apart from studying the processes of change, it is also essential to study the mental and social attitudes of the carriers of change. Sometimes we believe so strongly in the goodness of change that we think that only irrational beings will refuse to accept the type of change we advocate. And this mental attitude bars us from looking into the method by which we try to introduce changes, particularly in the so-called under-

developed countries. My experience has been that when we try to introduce any particular change which we believe to be good, we go ahead without thinking of what has gone before, particularly the attitude of the farmers who have grown their crops for the past thousand years and have managed to feed themselves. When we fail to persuade the African farmer or the Asiatic farmer to accept a particular change, we tend to say that he is conservative.

I should like to give two examples to illustrate my point. In the 1920's, we in Nigeria tried to convince farmers of the value of green-manuring. We told them to grow Mecuna, a particular type of legume. Of course they grew it for one season, but at the end of the second season refused to grow it any longer because it did not bring any direct returns. On the other hand, in the coco-growing areas of Western Nigeria for many years the coco has been debilitated by diseases. When the farmer was introduced to chemical spraying he accepted it because he could see the direct results of that particular change. The point I am trying to make is that the advocates of change sometimes tend to think that nothing has gone before, that the particular change which they are trying to peddle is best, and that all rational human beings would accept it. But the concept of rationality varies in different environments. In Europe it may be different from the concept in Africa. We should study the sociological environments and abandon the idea, which to many farmers sounds arrogant, that change from overseas is necessarily good. In my country farmers tend to listen to you, but after you have left they will say, 'Look at this arrogant agricultural officer', and continue in their old ways. The agricultural officer may be a European or he may be an African who has been trained in a university. The training of these peddlers of change ought to be studied. What kind of method, what kind of approach have we taught them? Unless we study the particular methods of training we shall find it impossible to change the traditional methods of farming.

B. GURSOY, *Siyasal Bilgiler Facultesi, Ankara, Turkey*

My remarks will reflect some aspects of Turkish life but they will have world-wide application. The first point I would make is about social change. The evolution of social life which is beginning everywhere is a slow process. But in the world today people cry out for more rapid change—change that is rapid but balanced. Education is one of the means that could be utilized most fruitfully in this regard. But education itself is faced with concepts of ways of living that have

existed ever since the world began. In other words, education is trying to bring about changes in social environments which have satisfied many people for centuries. It is not surprising that people are sometimes sceptical about new ideas and new techniques.

My second point is that the developing countries are adopting new techniques and also new institutions. Among the new institutions one of the most important, perhaps, is due to the concept of democratic ways of life. I think it would be well worth while to initiate studies in these developing countries to discover which of these two changes, the technical know-how or the social and political institutions, is developing the faster. In Latin America it may be true to say that people are more passionate about the political changes. If so, it would be another form of what Mr. Aziz has called exploitation, though in this case it would be the leaders, the politicians, starting to exploit this new aspect of social change.

L. W. WITT, *Department of Agricultural Economics, Michigan State University, East Lansing, Michigan, U.S.A.*

I am not sure whether it is entirely appropriate to comment on a commentator rather than on the speaker. But I should like to comment on several things to which Mr. Aziz has referred. First of all, there are a number of studies of change in some of the under-developed countries which may be useful. I am thinking of some sociological studies which have been made in Costa Rica. Here it is indicated that if the practice is directly related to the farmer's welfare, as our friend from Nigeria suggested, it is far more likely to be taken on. Some studies of the use of chemicals to control ants indicated that this particular practice was widely adopted, whereas similar and even more intensive efforts to get farm families to boil the water which they used in home consumption—a practice less obviously connected with welfare—were much less effective.

Mr. Aziz leaves us with a feeling of frustration, inferring that there is not much that can be done. Yet if these problems are studied, although the techniques for change may differ because of differences in institutions, still there are possibilities for progress. Changes which are appropriate for an under-developed country will not be the same as for a developed country. I understand that in his own country there has been greater difficulty in persuading small farmers to adopt the higher-yielding strains of rubber than in persuading large farmers. Even so, something of the order of 35 or 40 per cent. of the small farmers are now planting these improved strains. A

sociologist who has studied the changes in a small community in Brazil, has indicated that those members of the community who had come in most recently and who were least involved in the social fabric of the community, were the first to react when a road was built and new opportunities opened up. Some began to produce charcoal and brought in trucks to take it to a market which had become a feasible economic outlet because of the lower freight rates. Despite the agrarian structures, despite the many institutional factors to which Professor Aziz refers, changes are going on in the underdeveloped countries. It is appropriate to study them and the reasons for them and to try to determine which of them are more appropriate and suitable.

M. EZEKIEL, *Department of State, Agency for International Development, Washington, D.C., U.S.A.*

I want to make a few comments on this problem from the point of view of some sociological observations I made while doing economic work. Although these were observations made while doing international work, I have to bring some American points of view into them. I think all Americans visiting Europe are impressed by the difference in cultural attitude, as a rule, between northern and southern Europeans. Northern Europeans, perhaps because they have been longer without servants in their houses, are not afraid to do things with their hands. Southern Europeans, perhaps nearer the feudalistic period, generally make a great cultural distinction between the people who work with their hands and the 'educated' people who never get their hands dirty, and whose contact with the others is rather distant. In fact, in some of these countries the son of a peasant remains the son of a peasant whatever happens. There are two groups in the society: the peasants and their sons, and the more literate people who may condescend to talk with the others but who have very little direct contact with them. When these various countries began to educate less-developed countries through colonialism, the people who went to serve in civil service for the colonial powers, and even the educators, both northern and southern Europeans, generally seemed to take on this feudalistic point of view. Although they might work with their hands at home, when they got into the new countries where there was a great economic gap between them and the mass of the people whom they were sincerely trying to improve, they still maintained the point of view that they were a superior race. Many of the difficulties which some of the colonial and

ex-colonial countries face today are due to the fact that, with the advent of freedom and independence and with the natives of these countries taking over the governing and directing posts in society, they have also taken over both the standards of living and the habits of thinking of the colonialists who occupied these posts before them. That is a cultural lag which is quite unnecessary. My strongest reaction to it was at a training seminar I conducted once, with many other organizations helping. After three months' training, when we were saying goodbye, the students told me that the thing that had impressed them most occurred when we were going out on a trip and we had our belongings on top of the buses. I knew it was going to be a rough road and it looked to me that the servants had not tied the belongings down very well, so I got up on top of the buses and tied them down myself. The fact that I was interested in their not losing their possessions, and the fact that I was willing to do something for them with my own hands had made more impression upon them than all the teaching we had been through. This is an applied part of sociology for the benefit of those who are trying to encourage changes. They should ask whether in trying to carry out change while at the same time maintaining social distinctions they may not be putting a brake on the willingness to accept the ideas they bring.

HELEN C. ABELL, *Rural Sociology Unit, Economics Division, Dept. of Agriculture, Ottawa, Ont., Canada*

I am a very brave soul as a woman and as a rural sociologist in this group, but I would like to commend both Professor Hofstee and Dr. Aziz on their comments. I was afraid that we were going to be given something about correlating buttons on a sleeve with some other factor as 'sociology', and we came close to it. What I should like to say is, simply, that it has been stated both implicitly and explicitly that change is good. Some of the speakers from the floor have tried to point out that this is not necessarily born out by the facts. I would mention a piece of research we did in Canada at the request of one of our provincial economists. We co-operated in a study to discover why certain farmers in one of our prairie provinces had not enlarged their land holdings. This was of concern because it was contrary to the normal trend, and we came up with some very interesting findings. In a free society, where credit was available, and education free and compulsory, we still found people who did not wish to follow the trend of other farmers. One of the primary

reasons for this tied in with ethnic origin. These farmers had come from Europe, chiefly from central and northern Europe; they had carried with them a deeply rooted attitude that it is dangerous to become indebted. In spite of, in some cases, two generations in a new country, this attitude had not changed. The importance of this is that, when a sociologist says that we must understand farmers' attitudes, the extension worker must be aware that it is this emotional, and often a strong emotional attitude that we have to work with.

E. W. HOFSTEE (*in reply*)

To begin with, I want to say something about the remarks of Dr. Aziz. Let me emphasize that I never said that change as such was good. I only said that the idea that change was good for society and for the individual developed as a certain attitude, a certain way of thinking, in our society only during recent centuries. In my opinion change can be good and change can be bad, but the way I personally think about it is of no importance. I was speaking not as a moralist nor as a philosopher. I spoke as a scientist. I did not give moral judgements. The most important point made by Dr. Aziz is that there is a fundamental, essential difference between the developed and the under-developed countries. I do not deny that there are differences—very important differences. On the other hand, I believe that in many respects our countries are fundamentally alike. I have the impression that many of the people who are here from under-developed countries—and I think it holds partly for Dr. Aziz—have a wrong conception of the Western developed society, especially of the historical perspective of this society. The labourers in the so-called developed countries lived, only a few decades ago, in conditions which are strongly similar to those of the poorer classes in many under-developed countries today. When you study the recent history of Western countries you find very clear examples of social behaviour which are characteristic of under-developed countries. In The Hague we have the so-called Institute of Social Studies, an institute which gives an education in social sciences to people of the so-called under-developed countries. Often I have advised people there not to study primarily the present situation in the Netherlands, but its recent social history, especially the social history of the countryside in the eastern and the southern part of our country. For when you go back a hundred years in the history of these regions you find real under-developed areas. The study of the development of these areas would be very instructive for the people of the under-developed countries

who are studying the Western countries. They would learn then that there are in fact not so many differences between them and us; and they would learn also how these differences could be overcome.

Talking about colonialism, one can find social phenomena in the recent history of Western countries that were never called colonialism but that are essentially the same as the phenomena which are now indicated by this term. I could give you examples of that. Summarizing, I believe that Dr. Aziz's conclusion, that the way to study the problem of agricultural development in under-developed countries must be essentially different from that in developed countries, is not right. Of course, there are many differences of a secondary character. They should be taken into account. But I believe that many methods and techniques in use for the study of the sociological aspects of economic development in the Western countries can also be used in undeveloped countries. There are several examples to prove that. Dr. Witt mentioned some of them. I remind you also of the studies of S. P. Bose in India; one of them was published a few months ago in the American journal, *Rural Sociology*. In fact he used the same methods and basic concepts as we do.

At my university rural sociology is split into two parts, rural sociology for the Western areas and rural sociology for the non-Western areas. I am responsible for the Western areas. But when my colleague for the non-Western areas and I discuss our problems we always come to the conclusion that there may be differences of degree between the conditions we meet in our respective areas but no essential differences. So far, my answer in general to the remarks of Dr. Aziz. I believe I have no time to answer all the detailed remarks that he made. He is right, of course, when he remarks that loans are not considered wrong everywhere. If he had listened carefully to the reading of my paper he would have heard that I inserted the word 'often'. I agree it was a slip of the pen when I wrote it in this way. As to the remarks on the 'affluent society', especially on the tendency to conformism, I am not convinced that Riesman is right in all respects. Of course, his book, *The Lonely Crowd*, is very stimulating for your thinking, but I do not believe that he gave a true picture of modern American society. The affluent society in America has certain characteristics which are not very agreeable. On the other hand, those who know the United States will agree that American society has very pleasant characteristics also. I do not believe you can find an argument in Riesman's book from which you can conclude that the affluent society shows an undesirable development of modern culture.

What Miss Abell said about a group in Canada fits in with what I mentioned about groups in Europe who do not like to accept change.

My time is up, but I should like to make one further general remark by way of a short comment on Dr. Ezekiel's statement about differences between northern and southern European culture and the transplantation of southern European attitudes towards manual work to the colonies. I think we can define colonialism as a type of society in which a small group of people who are in power are exploiting the great mass of the population not only in the economic sense, but especially for personal services. When we define colonialism in that way, you can find colonialism in the history of all countries of Europe, albeit in different periods. When you go back in north-European history, you find that type of society also, but at an earlier stage than in southern Europe. When northern Europeans brought it to their colonies they were maintaining conditions which existed in their home countries one or two centuries earlier.

(3) INSTITUTIONAL ENVIRONMENT

K. SKOVGAARD

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IT is inherent in agriculture to be predisposed to institutional arrangements in most fields of production and management. In consequence institutions are pre-eminent tools for the promotion of agricultural development and the implementation of policies. This being early recognized, the growth of institutions in both public and private domains is far more advanced in agriculture than in any other industry. Furthermore, a progressing agriculture breeds a continuously increasing number of technical and economic problems many of which are most adequately solved institutionally. It follows that there is an easily verified correlation between the level of development of agriculture and that of the agricultural institutional environment.

There are good reasons why institutions are so easily adaptable to agriculture. The production problems of farms are very similar or quite uniform over vast areas within a country. This means that the farmers of a region or a whole country face very similar technical or economic problems at the same time, so that institutional arrangements are appropriate or even necessary, and the more so because of

the small-scale enterprise peculiar to agriculture. The cause of farm-size structure is a story on its own, highly institutionally determined by the way, but in the small and middle-sized farms which predominate in most countries the similarity of problems and identification of interests are strongly emphasized. There exists an interesting and important interdependence between farm size and the institutional environment. Small farm size promotes the advancement of agricultural institutions which simultaneously preserves or even fosters the small farm.

It is essential to the development of a favourable institutional environment, however, that the farm population should have a positive attitude of tolerance, responsiveness, willingness to co-operate, and confidence in the undertakings. A deficiency in one or more of these qualities inevitably forms a bottle-neck for the utilization of the existing agricultural institutions and the promotion of new ones. When such obstacles have been overcome through education and information the uniformity of interests of the small producers is easily appreciated and smooths the road for progress and participation. In this respect an absence of competitive feelings among the farmers is of particular importance. Although the marketing of agricultural products comes fairly close to the ideal model of free competition, the individual small farmers do not necessarily consider their neighbours competitors but rather collaborators.

Following these general introductory remarks I shall elaborate my topic concretely with special reference to the conditions prevailing in my own country, Denmark, and the neighbouring northern European countries, Finland, Norway, and Sweden, partly because the institutional environment of agriculture is fairly well developed in these countries and partly because the vastness of the problems involved makes some restriction necessary.

In the part of the world of which I speak the conditions have been favourable for the development of agricultural institutions. In each country the production pattern is uniform or approximately uniform and the farm-size structure is characterized by a prevalence of small and middle-sized family farms while large farms are relatively few and of little importance by number and constitute only a small proportion of the total acreage. In spite of an extremely individualistic outlook and a considerable social divergence between the various social groups, there exists within the main groups of farmers a widespread sense of cultural and economic solidarity which is an essential prerequisite of a developing institutional environment. In this respect the group of middle-sized family farmers have played a dominant role.

They represent a relatively large proportion of the total number of farms, they form a rather uniform group socially and culturally, their economic interests are uniform and they reconcile, or form a connecting link between, the groups of the smaller and larger farmers. For many years the initiators and leaders of agricultural institutions have come mainly from this intermediate group which also has had a prominent political influence.

Agricultural institutions are conspicuously different in character and origin. To approach the problems it is appropriate to distinguish between informal and formal agricultural institutions and to divide the latter into two subgroups, formal groups under public and under private control.

The first group, the informal agricultural institutions, originate through tradition, convention, and experience and they are of course the older ones. Although they are without legal status they very often have as great or an even greater influence than formal institutions, and last longer. It is particularly so when they establish rights or usages, as they regularly do, in the tenure, use, and inheritance of land and farms. These may be for the better but are more often for the worse. In the latter case the informal institutions are obstacles to development and their discontinuation or rationalization are primary objects of agricultural policy. This has been largely taken care of so far as tenure is concerned in my own country and in the neighbouring countries, a problem to which I shall return in a moment. I wish first to make a few more comments on the informal institutions because they can be of great importance in preparing the ground for the formal agricultural institutions.

The formal agricultural institutions are established in one of two ways, either they grow up of themselves, developing from small, local undertakings into nation-wide institutions, or they are established fully from the beginning by law or general decision in the expectation that they will meet some need or solve some problems. Either procedure is adopted according to circumstances, but the farmers in the northern European countries are strong believers in the former principle, that their institutions are most appropriately developed through organic growth. In my own country it is proverbial that to do well agricultural institutions must grow up from below. The arguments are quite convincing of course, the main idea being that in this way institutions are tested and moulded to the needs of the farmers, and their success or failure prove the extent of their usefulness. The origin quite often has been the small local, more or less informal, undertaking which spreads, amalgamates or unites

into formal groups and finally into a nation-wide institution. A prerequisite of efficient development is that the farmers possess a mentality of institutionalism and are prepared to take the initiative themselves whenever it is appropriate.

Of the two categories of formal agricultural institutions, under public and private control respectively, the former is by far the oldest while the latter has developed during the last century at a very fast rate. This does not tell the whole story, however, because of the close interdependence between the two categories of institution of which the one is frequently a prerequisite of the other, a point on which I have a little more to say later.

The institutions in the public domain are set up according to law or public order and provide for a very composite and extensive number of functions. In their entirety they are instrumental in creating the economic and social climate in which farm people work and live. For this reason it is of decisive importance that they take account of and are fully compatible with the mentality and expectations of farm people. In these respects it is traditional in the northern European countries to have close co-operation between the governments and the farmers, generally represented by their institutions. Factually, the initiative in developing new and amending existing agricultural institutions in the public domain is generally taken by the farmers themselves who are consequently engaged in the implementation. In this way the interdependence which I mentioned before between the institutions in the public and private domain comes into the picture again. In my own country the prevailing conditions are probably as typical as anywhere seeing that the farmers' institutions are freely promoting or delegating functions to institutions under public control, while watching jealously that they preserve a decisive influence on the implementing bodies of the institutions.

It is not pure harmony of course. The framing of the fundamental principles of the institutions under public control is subject to the principal doctrines of the ruling political majority. Whenever political principles are involved divergences and disagreements may appear but the Government will always have the support of one of the political and social groups into which the farmers are divided.

There are important distinctions between the impact and accomplishment of the different public agricultural institutions, and it is appropriate to consider them according to their functions: (*a*) institutions which establish general or compulsory conditions to which farmers have to adjust themselves, and (*b*) institutions which establish utilities to be used at the discretion of the farmers.

The first group comprises land tenure in all its aspects, compulsory social institutions, a number of measures to eliminate waste, to increase efficiency, and to establish controls. Finally, it includes the various institutions for the support of agricultural prices and incomes. Provided they are considerate and useful and accepted by the farmers it is of obvious importance to develop this group of institutions, and in my own country they have been steadily increased in numbers as the years have passed by.

It is beyond the scope of my paper to give more than a short survey of the various groups of institution. I begin with land tenure, the oldest and one of the most important. Traditionally the agricultural policy of the northern European countries has endeavoured through appropriate provisions to promote the owner-occupancy of farms, an attitude which is in full harmony with the mentality of the farm people. To my knowledge there exist no legal provisions preventing tenancy, but the method of tenure has veered towards owner-occupancy none the less and is supported in this by other measures. In this climate owner-occupancy has established itself as an informal institution of great impact. Of the total number of farmers 92 per cent. are owner-occupiers in Denmark, 98 per cent. in Finland, 93 per cent. in Norway, and 81 per cent. in Sweden; the lower percentage of owner-occupiers there being mainly a result of history, representing no departure in principle. In consequence of the prevailing owner-occupancy, there has been no need for specific laws on tenancy except in Sweden where there are rather strict rules with special reference to the smaller tenant farmers.

I shall not discuss the merits and drawbacks of different systems of land tenure. I wish only to emphasize that in my own country owner-occupancy has been one of the more essential institutional environmental conditions of development because, in principle at least, it solves most of the economic, legal, and social problems which are bound up inseparably with the use of land and farms. The security of tenure and property of the owner-occupier is a valuable social function even in a welfare state and promotes the careful utilization and development of resources as all values accruing from improvements are assured to the owner-occupier. A shortcoming of the system, however, *is the need of the owner to finance the whole farm property, and a prerequisite of an efficient owner-occupier system therefore is the organization of agricultural credit institutions which are able and ready to replace the functions of the landlord as the provider of finance for the fixed capital, a problem of which I have a little more to say later.*

We have had an excellent paper on the sociology of the agricultural

environment so I need only mention that in the northern European countries the social institutions have become one of the fundamental prerequisites for the development of today's agricultural environment because they have so deep an influence on the living and working conditions of farm people in general and of the small farmers and agricultural workers in particular.

In agriculture many problems of technique and business arise which can be solved efficiently only within a public institutional framework of a general and compulsory character, such as the control and combating of pests and diseases of plants and animals, control of qualities, declarations and standardizations of means of production and agricultural products. The necessity for such measures is quite obvious especially when the small scale of farm size is considered. The more progress that can be made in these directions the greater the security the farmers obtain in their management. In Denmark this has been fully appreciated by the farmers who in their co-operatives, for instance, have originated many of these institutions themselves, turning them into public institutions when they have reached a certain stage of development. In other cases the framing of the institutions has resulted from negotiations between the governmental bodies and the farmers who are always heard in such matters so that full co-operation is secured.

Concerning the institutions set up to support agricultural prices and incomes I shall make only a few remarks, despite their great importance in the development of an agreeable agricultural environment. If I am very brief on this important side of our problem it is mainly because this type of agricultural institution is much further advanced in other countries than in my own, and for this reason I have not much to contribute. In the other northern European countries comprehensive and well-organized institutions for price and income support or guarantee have been developed, but with some comparatively unimportant exceptions the Danish farmer has to be satisfied with open-market prices and adjust his production accordingly. In consequence he has had to put more emphasis on the development of the institutional environment which is within his own influence and imagination. During recent years, however, the farmers' terms of trade have continuously worsened because costs have been rising while the price-level has been falling, or at the best stationary. In these circumstances the farmers are taking an increasing interest in the establishment of institutions which will stabilize their economic environmental conditions as in other countries.

The second group of agricultural institutions in the public domain, those which establish utilities to be used at the farmers' discretion, are of course general in the sense that they are open to everybody. But the utilization of the services depends, nevertheless, on the farmers' own initiative and will to co-operate. Here I deal mainly with the institutions in my own country as those in the other northern countries are different.

The utility institutions provide services in many fields of management and production. They comprise service organization in agricultural education, information, and advisory work, research and experimentation, agricultural credit, techniques in plant and animal breeding, land-reclamation and improvement, land consolidation and construction, &c. These institutions are generally organized according to law, but to achieve efficiency of performance it is of vital importance that they find acceptance and support from the farmers. This is accomplished in Denmark by delegating the administrative functions to bodies composed of experienced and highly esteemed farmers or to farmers' associations and even to private institutions and persons. For this reason the administration of the public utility institutions is highly decentralized even though subject to the authority of the ministry of agriculture or other ministries. In this way the farmers have been familiarized with all the opportunities offered by the utility institutions in the guidance of which they take a pride. In consequence of this highly decentralized administration there is a considerable overlapping and interdependence between the public utility institutions and the farmers' own institutions. Looked at from the outside the system appears rather confusing, but it has been possible in this way to stimulate the development of the agricultural institutional environment.

The objectives of the different public utility institutions are amply dealt with in other papers delivered at this conference and for this reason I shall merely re-emphasize their great importance in making available to farmers many measures and improvements which otherwise would be beyond their reach. This is especially important for occupiers of the small and middle-sized farms. It holds true in general and is a prerequisite to all development that the financing of investments must be on terms which are reasonably in accordance with the slow disinvestment rate peculiar to agriculture. In consequence, the proper organization of agricultural credit is one of the corner stones of a developing agricultural environment. This was recognized long ago in the northern European countries where the setting up of agricultural credit institutions has in reality formed the introduction

to the existing institutional environment. In all four countries the governments furnish some credit for the development of different improvements, such as land reclamation, drainage, and consolidation. Apart from this the provision of fundamental agricultural credit is predominantly a service of co-operative credit associations and savings banks. These institutions are subject to legislative regulations and public control, but for all practical purposes they form an integral part of the general co-operative framework as their administration and implementation are in the hands of the farmers themselves.

Finally I shall mention the institutions under private control and here I confine myself to the institutions set up by the farmers themselves. In the northern European countries they fall into two closely interrelated categories: (a) the co-operatives, and (b) the farmers' associations; the close relationship being due to the simple fact that the membership is more or less identical.

In the northern European countries co-operation has been particularly successful owing to the previously mentioned uniformity of production and the farmers' recognition of the usefulness of this form of enterprise. With rare exceptions the co-operatives are pure business enterprises and participation depends on the advantages the farmers expect to gain. The main objectives of starting co-operatives are (1) to gain the advantage of large-scale operation, (2) to obtain control of, and to strengthen competition in all lines of business relating to farm-production, and (3) to get new and appropriate undertakings started. All three objectives are regularly involved together but the motives for starting any particular co-operative may be any one of the three, depending on circumstances. In the present context I find it appropriate to emphasize that the last objective mentioned, the initiation of new undertakings, is usually pre-dominant. The co-operative system has become an integrating part of the institutional environment to such an extent that farmers never hesitate to get together to solve new problems co-operatively.

The co-operatives are highly specialized according to function and enterprise and more so in Denmark than anywhere else. Their great success is in no small degree due to this specialization because it solves the problems of contrasting interests. In consequence the individual farmer is a member of a good many co-operatives, usually eight or ten, often as many as fifteen, and for true believers even more.

The affiliation to the individual co-operatives expresses the econo-

mic interest the farmers are taking in each branch. This is summarized in the figures in the accompanying table.

Percentage of Agricultural Products handled by Co-operatives

	Denmark	Finland	Norway	Sweden
Milk	91	89	100	98
Cattle	45	70	59	83
Pigs	88	..	..	..
Eggs	40	54	47	65
Grain . . . . .	..	30	*	70
Fertilizers	41	52	65	60
Feeding-stuffs	58	60	..	..
Machines . . . . .	..	53	28	50

* State-monopoly.

Calculated as percentages of each group of farms, the participation is highest among the small and middle-sized family farms and it is mainly these last, the middle-sized family farms, which have furnished the leadership. The development of the co-operative institution is mainly a result of their work and enthusiasm.

Although the co-operatives are almost exclusively business enterprises they have had an invaluable indirect educational influence also by disseminating *know-how* in technique and management. The widespread co-operatives continuously present the farmers with a number of problems of management and production which must be solved in the interests of efficiency within the co-operatives themselves as well as on the farms.

The farmers' associations have long traditions in the northern European countries and nowadays the great majority of farmers are members of one. In all four countries the associations represent group interests, but in Denmark they also perform many of the services which in other countries are organized by the public utility institutions. For instance, the farmers' associations organize and take responsibility for the advisory service, local experimentation, the control and advancement of animal breeding, vocational training, farm accounting, general information, &c. These activities are carried out by agricultural advisers and employees appointed by the farmers' associations, but the costs are usually subsidized by the Government on a 50-50 basis. In this way the farmers have been familiarized with all the functions and services of the agricultural institutions and the farmers' associations have in reality been of decisive importance for the development of the agricultural institutional environment.

In concluding I wish to re-emphasize that the external conditions in the northern European countries have certainly been favourable for the development of a well-integrated institutional framework, but the experiences of these countries show, nevertheless, that the usefulness of any institution is completely dependent on the extent to which it is in conformity with the attitude of the farmers. My final point is, then, that of all the institutional environmental conditions for development the most important is the establishing of institutions in such a way that the full participation of the farmers is ensured. The proper way to do this is to persuade the farmers themselves to engage in the establishment, the leadership, and the working of the institutions.

Y. LOWE, *Ministry of Agriculture, Hakiryia, Tel-Aviv, Israel*

Although the institutional arrangements in the highly developed agriculture of Europe are important, the real effect of institutions on the creation of proper settings for the growth of agriculture can best be studied in countries which are still developing. It is for this reason, I presume, that I was honoured with the task of opening the discussion on this topic.

Let me describe in short the preconditions for changing a primitive to a modern agricultural economy in Israel. The first condition is a proper land tenure system. Professor Skovgaard stressed the fact that in northern European countries owner-occupancy is the characteristic trait, whereas in Israel land is mostly held in tenancy. But it is a very special form of tenancy which so assures the rights of the tenant that it closely resembles owner-occupancy. Land held by the Jewish National Fund is leased on hereditary leasehold for forty-nine years with the right of renewal, and passes from one generation to the next. Rents are very low (2 per cent. of the value of the land), being reassessed from time to time. The J.N.F. is a typical institution created by the Jewish people long before the establishment of the State of Israel with the declared intention of enabling immigrants to become farmers without having to invest in land purchase. Nevertheless, it fully preserves their rights and evokes their interest in making investments in soil improvements. A second institution, also created prior to the establishment of the State, was the Foundation Fund, which provides settlers with credit on long terms at a low interest rate for initial farm investments. The third institution is the countrywide network of marketing organizations, based upon co-operative institutions for the sale of produce as well as for the

purchase of farm supplies and household goods. On these three pillars rests the structure of agriculture in Israel.

On this basis there have developed various forms of co-operative farming characteristic of Israel's agriculture as represented by Kibbutzim (collective large-scale enterprises) and Moshavim (co-operative smallholder settlements) which account for more than two-thirds of the agricultural economy. Without these institutions, created for and borne by the farming community itself, although largely dependent upon comparatively huge amounts of capital from abroad, the rapid development within one generation from a primitive subsistence agriculture to a modern market-orientated highly intensive farming system could not have taken place.

Foreign observers, especially those from developing countries, often regard Israel as a kind of pilot plant where the preconditions for developing agriculture in their countries in a similar manner may be studied. Being impressed by what they see, they tend to believe that by imitating it they can reach the same goal. Here a word of caution may be appropriate. Institutional organizations must grow from within if they are to fulfil their tasks properly. Outer resemblance in itself is no guarantee for success.

Take as an example the organization of a co-operative village composed of individual family farms, which we call a moshav. It is not just a conglomeration of individual family farms buying and selling co-operatively. I used to explain this to our friends from Afro-Asian countries by saying: 'Putting farmsteads in a circle does not create a Nahalal.' This is the name of our first moshav, which became famous by its distinctive layout with its co-operative institutions in the centre surrounded by homesteads in a circle, each having its land behind stretching out like the spokes in a wheel. The distinguishing feature of such a moshav, which is quite different from the forms of co-operation described by Professor Skovgaard, is the fact that the village as a whole forms *one* co-operative of which each farmer is *eo ipso* a member. He cannot choose one and leave out another co-operative institution. The village co-op. fulfils every co-operative task. This includes not only buying and selling but also maintaining all kinds of services, such as water supply, incubators, feed mixing, credit arrangements, book-keeping, running the local store, and providing all the municipal services. It covers its costs in three ways: by deducting fees from sale values, by adding fees to purchase prices, and by charging direct taxes. Its main purpose is to set the settler free from all duties outside his farm so that he can concentrate on production and on managing his farm.

This providing of services is a costly process. Its annual costs may run into more than a thousand Israel pounds per farm, representing an amount which is nearly half of what is spent on living costs. The surprising fact is that in the best villages where the absolute costs of services are highest they form the smallest percentage of the output-value per farm, and vice versa. This brings us to the very important conclusion that co-operation in its highly developed form pays its way, provided the beneficiaries are able to put all their released energies into developing the farms to the utmost. Put in a different way, co-operative services, costly as they are, do not serve a useful purpose if the savings in time and energy are wasted, as may be the case when farmers are in effect under-employed. One has carefully to examine the correct relationship between creating institutions (which in any case are an additional outlay for the farmers for whom they are established) and the alternative use to be made of the released time and energy. If they can be used to increase the value of output it is worthwhile, otherwise the institutional environment may become a burden rather than a benefit in an economic sense.

The closed form of co-operation, as found in a moshav, presupposes a highly developed spirit of co-operation among all member farmers. If even a few settlers stray away from the institutional framework, it tends to damage the whole. Farmers who use their credit facilities for purchasing farm and food supplies but who withhold their sales from the co-operative disturb the balance between turnover and credit. They become bad debtors, and upset the credit arrangements of the whole village. This is one of the reasons why the highly integrated form of co-operation such as exists in a moshav cannot easily be recommended for imitation unless the community is well educated in the purposes of co-operation.

Lastly I should like to raise the question, where to start building up the proper institutional environment for furthering agricultural development—from the top or from the bottom? Which comes first: organizing farmers into village marketing co-operatives, or creating co-operative wholesale organizations on a regional or countrywide basis? It is not easy to decide. It seems that both sides have to be tackled concurrently so that the one can grow organically along with the other.

When conditions are changing, when old-established forms are being dissolved and new ones beginning to emerge, it is of vital importance to give the farming community a new lease of life by trying to tackle all the old forms at once, if necessary on a small scale, rather than just one at a time. Land distribution without proper credit

facilities is often of little value for the small farmer, just as producing is not enough in itself if no proper outlet for the produce is available to assure him of his fair share of the price. There can be little doubt that sound agricultural development, especially in an expanding economy, depends to a large extent on proper environmental conditions among which institutional conditions take a place of first importance.

LUCA DURANDI, *Istituto di Economia e Politica Agraria, University of Turin, Italy*

I am in full agreement with the reasons given by Professor Skovgaard to explain the evolution from a peasant society to a farmers' society in the Scandinavian countries. I would appreciate it if he would comment further on whether he thinks new institutions are now necessary for the progress of Scandinavian family farms. For example, does he think that more advanced forms of co-operation in farm management are necessary?

Secondly, can he suggest ways and means which would be effective in bringing about a social evolution in other countries like that experienced in Scandinavia where farmers form a well-defined social group? I think one has to resort to regional planning, paying particular attention to the human material. In a regional development plan, if limited means are to be used effectively, attention should be concentrated on those who are most likely to be good farmers. The rest of the farm labour force should be helped to take up other productive activities. Only in this way can a dynamic rural society be established.

H. S. MANN, *Department of Economics, Government College, Ludhiana, India*

I have some comments on the importance of high standards of public administration and of the management of public and private enterprises in developing countries. The secret of rapid development of advanced countries under a system of private enterprise lies in hard work in conditions in which the person who works hardest gets the highest reward. This principle underlies the innovation theory of profits according to which the innovator, in the broadest sense of the term, gets the reward in the form of profits for his contribution to the development of the country.

If, in a developing country, the public administrator or the manager of a public or private enterprise is inefficient and is unable or unwilling to play the role corresponding to his status, not only is there a waste of scarce resources, but he would very often not like to have efficient persons in positions near him for fear they might outshine him. The persons best qualified may not get into suitable positions. In some cases, the personnel who try to please the boss rather than to do hard work get advancement and promotion. This creates frustration among those who attend to their work with a greater sense of responsibility. This is not a generalization, for in many cases the standards of administration and management in the developing countries compare favourably with the highest in the developed countries. But in situations where there is unholy competition among the personnel to please the boss by methods other than work, the contribution to economic growth would be very considerable if methods could be devised for developing healthy competition for getting ahead by *doing* work rather than by *shirking* it. Research into the amount of resources and time wasted in pleasing the boss in under-developed countries would be both interesting and profitable. The family farm where the farmer is self-employed should be free from this problem, but when irrigation, agricultural extension, supply of seeds, and fertilizers are channelled through public agencies, the importance of efficient and impartial public administration for the small farmers is great.

In the field of industry there may be a tendency to compete by cutting down costs, by adulteration and use of inferior raw material, rather than by improving quality. In some situations a section of the people may become so disgusted with the state of affairs that conditions are created for the birth of a dictator—a remedy which may prove to be worse than the evil.

The gap between urban and rural people, the administrator and the public, is wider in the under-developed countries. This calls for the highest priority for universal education in the early stages of economic development so that the child right from the elementary school learns the concept of the dignity of labour, love of work, social consciousness, and the importance of going ahead with hard work and fair play under conditions where the means are as important as the ends. This investment in human resources is important, both for economic development and the successful operation of democratic institutions. It is more than technical know-how that the developing countries have to learn from the developed countries. They need to acquire high standards of efficient and impartial

administration and management and to appreciate the importance of creating environments where reward corresponds with effort.

V. M. JAKHADE, *Rural Economics Division Reserve Bank of India, Bombay*

Professor Skovgaard has brought out the importance of co-operative institutions for encouraging agricultural development. This has been recognized also in most of the under-developed countries. But it has been the experience of many of them that institutions formed on the lines of classical co-operative principles do not develop successfully. Recently in India we have been trying to analyse the causes of this failure, and we find that the co-operatives which are mainly associations of small farmers with limited resources cannot compete on an equal basis with the powerful groups of money-lenders and traders.

The vested interests, such as the village money-lenders and the village traders, who are powerfully supported by the urban traders and the commercial banks, have a distinct advantage over the institutions of small farmers. There is no perfect competition between the two groups. Therefore, if the small farmers' institutions are to stand up to the competition of money-lenders and traders, they must be supported by the Government in the initial stages. It may sound unorthodox to recommend governmental participation in co-operative organizations, but wherever there is a democratic form of government, where the Government represent the wishes and aspirations of a majority of the population, the Government's participation does not mean any diversion from co-operative principles. After all, in a changing world, classical principles need modification if they are to attain the desired objectives.

N. B. TABLANTE, *Agricultural Credit and Co-operatives Institute, University of the Philippines, College, Laguna, Philippines*

It is recognized in the so-called less developed countries that the co-operative movement is designed for the benefit of small farmers, the low-income groups of the rural communities. These small farmers, however, generally do not have enough surplus to give sufficient volume of business to their co-operative marketing associations. In this connexion, some co-operative leaders in many countries are now planning to encourage the large farmers to join

the co-operatives so as to enlarge their business and make for better operations.

I should like to ask if they have had any experience in Denmark of encouraging the large producers to join the co-operatives?

SALOMON ECKSTEIN, *Bar Ilan University, Israel*

Both Professor Skovgaard and Dr. Lowe referred to co-operatives that grew, as it is commonly said, from the bottom up. These are contrasted, as a rule, with those that developed from the top down. However, this classification is a rough over-simplification and may lead to undue apprehension on the part of those countries that see no alternative but to establish co-operatives from the top.

True enough, societies in western Europe, Israel, the U.S.A., and Canada, started as popular movements by the initiative and determination of the co-operators themselves, carried on with little or no State intervention. Nevertheless, they were usually linked with some powerful social movement, and headed by leaders widely accepted and admired who dedicated their lives to this ideal. Thus, they were not devoid of some central guidance, basic orientation and public backing and sympathy which proved of utmost importance, although it did not necessarily take the form of direct State action.

In the 'from-the-top-down' group, like those found in Latin America and most developing countries, the initiative emanates from the Government who wish to encourage co-operatives which are to be called upon to fulfil certain economic and social functions. It is well known from the very outset that the mere legislative act will remain dead if adequate institutions and personnel are not provided simultaneously. The project will most likely fail if the Government does not succeed in arousing enthusiasm and creating induced (if not spontaneous) co-operation on the part of the peasants. On the other hand, it will have to provide central guidance and control until the societies are mature enough to take over. If these requirements are fulfilled, the gap between the two types of co-operative growth will be considerably narrowed, and the social disadvantage of having started from the top will be more than compensated by a genuine response from the bottom.

Mexico provides an excellent example of this. During the late thirties the then President Cardenas decreed, by legislative act, the establishment of rural co-operatives. At the same time, however, he became a popular leader who succeeded in launching a true social movement which was enthusiastically adopted by the rural masses.

The co-operatives were very successful in their early stages while this compound of official policy and popular response persisted.

We may conclude that it is better in principle if co-operatives grow from the bottom, as they did in Denmark and Israel. But if this is not feasible socially, as may be the case in most developing countries, they can progress very well even when started from the top, provided these other conditions are also met. And they will feel more confident if they remember, first, that it has been done elsewhere and, second, that even those societies which started from the bottom enjoyed throughout their development the continuous backing and support of some centralized movement, organization, and leadership.

V. W. EDMONDSON, *Department of Agricultural Economics and Sociology, College Station, Texas, U.S.A.*

Based upon a special study that I made in Denmark in 1950-1, and upon observations in my own country, I have come to the conclusion that the success of co-operatives depends to a great extent upon individualism being a part of the background of society. Success depends upon proper business procedures where any kind of favouritism, on a social basis, is ruled out. As Professor Skovgaard has mentioned, the matter of being primarily a business enterprise is very important. In patriarchal societies there may be impediments to successful co-operation because of certain pressures in favour of family or other groups with the co-operative. Organizational and business integrity is of prime importance.

GORDON H. WARD, *Faculty of Agricultural Sciences, American University of Beirut, Beirut, Lebanon*

The question has been raised whether co-operatives in the developing countries should be organized from the top down or from the bottom up. After observing them in a number of countries in various parts of the world it seems to me that we cannot give a categorical answer. They can be organized successfully either way, depending upon circumstances.

Coming from the American scene, I was predisposed towards development from the bottom up. But working in developing countries, I saw that this is not possible in many places owing to the lack of understanding of co-operatives by the farmers. When they try to organize a marketing society in a village where the volume of business is small and it is a seasonal crop operation, it is almost

impossible to get qualified people to operate the business. However, it is easier to do purchasing on a local basis. It seems to me that the new programme, such as they are advocating in India, by which village credit societies are integrated with larger area marketing and purchasing co-operatives, may be a successful way of handling this problem. This idea is being tried also in Jordan at the present time. It is being done through a government co-operative department which fosters the organization of co-operative credit societies at the village level. Then, through a union of these co-operatives developed with capable management, a marketing co-operative is organized to handle the products from the village credit societies, either on an agency basis or by direct membership of the individual farmers. Similarly, a large-scale purchasing co-operative is being developed to supply the things which are needed by farmers. The evolution of these integrated co-operatives is accompanied by technical guidance, inspection, supervision, and regular auditing to maintain financial responsibility so that the farmers will have confidence in the whole programme.

On the other hand, I think that Hong Kong offers a very good model for developing countries where farmers have no knowledge of co-operatives and where you have very well-trained, competent, and responsible government officials. There they have set up vegetable marketing and fish marketing organizations as government enterprises with directors and management who have a co-operative philosophy. The vegetable marketing organization set up collecting depots in the villages where the vegetables are grown. As a village achieves the volume at which the normal handling charge will be sufficient to provide a surplus above operating expenses, the people are encouraged to set up a local co-operative to handle marketing and other services. The organization then sponsors a credit co-operative to meet farmers' financial needs. Five per cent. of the proceeds of vegetable sales is deducted by the marketing co-operative for each member of the credit society and deposited in his savings account. The idea is that in the course of time these local service societies, with supervision, will develop local leaders who can be elected to the board of directors of the marketing agency so that eventually it will be converted into a co-operative owned and controlled by the village co-operatives.

My observation in developing countries has been that the development of successful co-operatives depends largely on: (1) Education of farmers and their wives to understand co-operation and how it works. This requires also continuing education for members of co-operatives. (2) A government or private agency to carry on the

education programme, to supply technical advice and guidance, to train personnel, to furnish supervision, and periodic auditing to develop and insure financial integrity. The staff of such an agency needs to believe strongly in the self-help, mutual aid philosophy of co-operation. (3) A financial agency to supply financial assistance to various kinds of co-operatives, and loan funds for credit co-operatives. (4) A positive thrift programme to accumulate the savings of farmers in credit co-operatives and to build up the capital of all kinds of co-operatives. (5) Development and training of managers and personnel to a high degree of competence so that co-operatives can compete successfully.

M. EZEKIEL, *Department of State, Agency for International Development, Washington, D.C., U.S.A.*

I just want to comment on America as an illustration of the private principle in co-operative formation, and remind some of the younger people here that two of the largest co-operative organizations in the United States, the farm credit system and the system of local rural electrification, both started with 100 per cent. public sponsorship and public funds. Only after they had proved successful were they gradually bought back by the individual farmers. I mention those two but I know a number of other co-operatives that started the same way.

One footnote on co-operation in under-developed countries: in many it is difficult to establish co-operatives or keep them working because the standards of local integrity have not been developed in that direction. The institution of certified public accountants does not exist in many countries. And the same applies to the whole institution of personal responsibility. It is whispered that in certain under-developed countries as much as half of the financial assistance received from abroad vanishes into private hands. The farmers fear that if they join a co-operative they may find some morning that the treasurer has absconded with all their funds. The one factor above others which decides whether co-operatives can be successful or not is the standard of individual service. Lack of a sound standard of public service is a serious limiting factor to successful co-operation.

K. SKOVGAARD (*in reply*)

I am very much in agreement with Dr. Lowe. He gave a straightforward presentation of the agricultural institutions in Israel. The more information we have of experiences in different countries the

better, but it was impossible in my short paper to describe them all. This was the reason why I confined myself to the Scandinavian countries of which I have some knowledge and which have a great deal of experience in this field of agricultural institutions. I am aware that these institutions vary from region to region and from country to country according to circumstances: economic development, historical development, cultural development, and so on.

There seems to be room for argument, whether these institutions, the co-operatives groups, should be organized from the top or from below. I quite agree that you can do it either way, but in my country it has been done predominantly from below. Mr. Ezekiel mentioned two co-operatives in the U.S.A. as examples of organization from the top. Before co-operative methods of organization of farm credit, for instance, were adopted by the U.S.A., the Americans made extensive studies of co-operative credit organizations in European countries. And some years later they came back to renew their studies in this field. And then the U.S. farm credit co-operative institutions were started from the top. It may be done that way, of course. Any country may organize co-operatives how they like and then learn by experience. But in the northern countries of Europe it has been left to the farmers themselves usually to organize the institutions in this field.

On the question whether we are developing new institutions, and whether new institutions have been necessary in this developing world, I can say 'Yes, year by year new ones are starting up and old ones are being overhauled or reorganized'. It is a great problem today to see how the co-operatives, in my country anyway, will meet the challenge of the future. We are going to co-ordinate the co-operatives of the whole country to meet competition from large-scale private firms. Large-scale international firms are competing with us in the food industry, and we are going to find ways of meeting this competition so that our co-operatives may remain intact.

Mr. Mann remarked that management may be more effective in the developed countries than in the developing countries. It may, indeed, be a problem in the developing countries to get fully educated managers in this field, and he thought they might have to rely on men of high academic rather than technical education. That may be possible, of course, but I would say that in my country the co-operatives and many other agricultural institutions have been organized and managed mainly by men of great practical technical experience, of course with high moral standards.

We were told that experiences with co-operatives in India showed

that they were not able to stand up to the competition of the money-lender and the private merchant. I have an impression that in many cases the pace in the developing countries is too fast. They are trying to set up the whole organization at once as they see it in the developed countries. We take great pleasure in seeing many of you coming to Denmark to study Danish co-operation. But I often doubt the value of the information you take away, because the procedure for setting up a co-operative in Denmark is probably quite different from that needed in many of the developing countries. I suggest that you begin in a very modest way; and I am quite in agreement with Mr. Ezekiel who knows more about these methods than I do so far as the developing countries are concerned. When the public authorities are behind such development it is sure of success.

Mr. Tablante asked how we persuaded the larger producers to join co-operatives. That is a problem all over the world. In the northern countries the larger producers have only joined when it has been to their advantage. For example, 90 per cent. of the farmers belong to the co-operative creameries for selling their milk, but for buying fertilizers and feeding stuffs only 40 or 50 per cent. belong, because the larger farmers are able to make better bargains in these lines than the smaller and middle-size farmers can. They join the creameries and bacon factories because they have an economic advantage in doing so. Where only half the farmers participate it ensures competition though it may be unfair of the larger producers to enjoy the advantages of this competition to the detriment of the smaller and middle-size farmers.

(4) HEALTH AND NUTRITION

WILLIAM J. DARBY

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THE crucial significance of nutrition for health, and of health for national productivity and development, does not require elaboration. It should prove useful, however, to illustrate some of the nutritional conditions which impede development and which deserve the consideration of those concerned with planning economic and agricultural programmes. In order to identify these it is helpful to review the nutrition-related problems considered by the six sessions

of the F.A.O./W.H.O. Joint Expert Committee on Nutrition from 1950 through 1961. Among these problems one finds: endemic goitre or iodine deficiency; pellagra; kwashiorkor or protein malnutrition; beriberi; nutritional anaemias; nutritional disorders of the eye, including avitaminosis A; degenerative diseases, especially cardio-vascular diseases (including atherosclerosis); nutritional needs of special groups such as the pre-school child, the pregnant or lactating woman, and the aged; feeding of workers and institutionalized groups (school children, hospital populations, orphanages, &c.).

Other pertinent subjects considered by these sessions include food regulations, food additives, nutrition requirements, the manufacture of nutrients especially vitamins, disaster feeding during war-time and other shortage periods, problems of nutrition among the aged, and strontium 90 contamination of foodstuffs.

All these reports have recognized the key position of education concerning nutrition as a factor in permanent improvement of the nutritional position of a country. In addition, repeated attention has been given to the question of assessment of nutritional level from health statistics, from estimations of the physical or medical status of the population, from biochemical investigations, and food consumption studies. Attention has been directed to these problems because it is essential to have knowledge of the nutritional position, resources, and potential of a country in order to formulate appropriate national policy. It is not enough to recognize that a serious health problem exists owing to a lack of a given nutrient; instead, one must understand the setting in which this problem has arisen and the resources needed to correct it.

In an effort to provide countries with such a nutritional assessment and to identify national resources as a basis for sound nutritional planning in relation to development, the United States Inter-departmental Committee on Nutrition for National Defense (I.C.N.N.D.) is assisting one country after another by conducting an overall nutrition survey and interpreting the survey findings in the light of national needs and programmes. These surveys include clinical examination and laboratory studies on a sample of the population, and studies of dietary consumption, food production and storage, distribution, &c. To date, nutrition surveys have been conducted in co-operation with the I.C.N.N.D. in seventeen countries (Iran, Pakistan, Turkey, Libya, Ethiopia, Lebanon, South Korea, the Philippines, Taiwan, Vietnam, Thailand, Burma, Colombia, Ecuador, Chile, Peru, and Trinidad), and within the next few months additional surveys will be made in Uruguay, Bolivia, and Jordan. Reports

resulting from these studies are available for use by the countries, by international agencies, and others interested in the national programmes.¹ The surveys catalyse interest in nutrition within the countries. They have included consideration of all of the points identified by the F.A.O./W.H.O. Joint Expert Committee's reports, and as a result of the stimulation of interest in the national problem and of the training and experience afforded workers in the country, plus a continuing interest and support, they serve to initiate corrective steps.

In the planning and execution of such studies, it is essential that several ministries and other branches of government, as well as industry, recognize their roles in the provision of adequate nutrition and the improvement of nutritional status of a country. The Food and Nutrition Board of the National Academy of Sciences has properly noted that:

Improvement of nutrition involves activity in many fields: public health, agriculture, education, social science, industry, commerce and others. In addition to assisting the civilian population, these activities serve the armed forces in meeting their special needs. Many of the activities have specific objectives which are related. They are being carried on by government and private agencies within the country and by similar groups from outside, and by various international agencies. Joint planning and programs having common objectives, and communication among agencies as activities are carried on . . . avoid unneeded duplication and increase results achieved from the overall effort. . . . It is clear that joint planning at the ministerial level in organizing such programs, and collaboration on related ones . . . make the overall national effort more effective. . . .

The inter-relationship of interests in a country cannot be over-emphasized. Agriculture is responsible for food production and for some aspects of distribution. Industry and commerce are responsible for processing and distribution of foods, for provision of the needs of their workers, and for making more efficient the non-agricultural portion of the food chain. Education is responsible for teaching food values, for instruction regarding domestic use (and production) of foods, and for increasing the knowledge of professional groups about nutrition. Defence, usually the largest single food-purchasing group within a country, is responsible for the economic use of resources towards the maintenance of the nutritional health of the military with, at the same time, an awareness of the needs of the civilian population.

¹ These reports of the work and findings of the I.C.N.N.D. nutrition survey teams may be obtained by writing to the Inter-departmental Committee on Nutrition for National Defense, National Institutes of Health, Bethesda, Maryland, U.S.A.

Oft-times defence, because of its large-scale purchasing power, can profoundly influence the national nutritional policy and level by specifying quality standards for the foods it purchases, through the food attitudes and practices which it develops in members of the armed forces, as a result of the example which it sets in relation to some aspects of food production, as well as through its general educational programme.

Goitre. Endemic goitre is a state of enlargement of the thyroid gland due to lack of sufficient intake of iodine. The disease may have an early onset, the highest incidence in most goitrous areas occurs in girls between 12 and 18 years of age and boys between 9 and 13. Goitrous populations experience a high incidence of hyperthyroidism or toxic goitres, an enhanced incidence of carcinoma of the thyroid and of other malignant conditions, an increased incidence of cretinism, and a large burden of surgical care for removal of goitre. Kelly and Snedden estimate that the number of goitrous individuals in the world is not far short of 200 million. The disease occurs with varying intensities; few countries are entirely free of it. That the disease is an iodine deficiency which may be prevented by the simple process of assuring that the diet contains small quantities (100-300 mcg.) of iodine per day is well established.

Salt has been demonstrated repeatedly to be a practical and efficacious vehicle for the distribution of this iodine. Machinery for the iodination of salt adaptable to small- or large-scale production has been devised and the process is economically feasible. Work encouraged by the World Health Organization has revealed that a stable form of iodine, potassium iodate, may be used to enrich crude salt. It has been calculated that the cost of a preventive programme of iodination of salt in the United Kingdom amounts to only 0.22d. annually (i.e., 0.44 U.S. cents). In a recent report of the nutrition survey in Ecuador by the Inter-departmental Committee on Nutrition for National Defense it was noted that the approximate cost of ingredients for iodizing salt amounts to 0.11 cents per pound of iodized salt. Expressing this in another way, 10,000 persons could be furnished the iodized product for the cost of ingredients of about \$18 per year. Simple methods for control of quality of iodized salt are available and extensive experience concerning types of regulations which are workable exist. All of these points have been beautifully summarized in a World Health Organization monograph entitled *Endemic Goiter* published in 1960.

Even more true than when stated initially by David Marine, 'Simple goiter is the easiest of all known diseases to prevent. . . . It

may be excluded from the list of human diseases as soon as the society determines to make the effort.'

This effort in each nation must be a conjoint one between commerce, industry, health, education, and law.

Protein malnutrition or kwashiorkor. This is a disease primarily of infants and young children, usually between the ages of one and four years. It is known by many names and its clinical course varies, depending upon the particular environmental setting in which it occurs. It is characterized by sub-normal weight, mental apathy, oedema, muscular wasting, changes in the texture and pigmentation of the hair, a decrease in the concentration of proteins in the blood, fatty liver, anaemia, and diarrhoea, and oft-times associated with respiratory or other infections. The mortality rate is very high in untreated cases and even among those receiving medical and hospital attention still may be as high as 10-30 per cent. The disease is due to an insufficiency of good quality protein in the diet of the young child, associated with a lack of calories, and oft-times aggravated by one or another infectious process. It is widespread and severe throughout most sections of Latin America, Africa, Asia, the south Pacific, and Middle East. Scrimshaw and Behar have noted:

Physicians working with children in hospital or outpatient clinics in areas in which kwashiorkor is endemic recognize severe protein malnutrition to be a serious problem. There is, however, a notable lack of appreciation of its magnitude and importance on the part of public health administrators and vital statisticians, who usually consider diarrheal disease a far more serious problem in this age group. . . . Deaths of children with kwashiorkor are almost invariably listed as due to causes which are later coded within the category of diarrheal or parasitic diseases. . . . Deaths occurring in children with underlying protein malnutrition which are not the immediate results of diarrheal or other infections are quite naturally not listed as due to malnutrition, even though a well nourished child would not have died from the infection alone.

As an example of the importance of protein malnutrition as a cause of death, the experience of the I.N.C.A.P. group in a two-year study in four villages in the Guatemalan highlands may be noted. In this study each death was investigated and the cause as determined compared with those recorded in the civil register. Of 109 child deaths (one to four years of age) over a two-year period, 40 occurred in children with signs and symptoms of kwashiorkor. Yet only one was officially listed as dying from malnutrition, and this was a child sent to the hospital and whose death was medically certified. Scrimshaw concludes: 'It is not exaggerating the role of protein malnutrition in

this situation to point out that the difference between the mortality rate for children, 1-4, in these villages of 42 per 1000 during the study compared with 1.1 per 1000 in the United States in 1956 could largely be eliminated if protein malnutrition could be prevented.' In regions suffering from kwashiorkor, frank cases of the syndrome are but a small part of the picture. Retarded growth and maturation are clinically observable evidences of the occurrence of protein malnutrition in the general child population of the pre-school and young school age. Scrimshaw has likened the kwashiorkor-prekwashiorkor relationship to an undersea mountain with but its tip protruding above the surface as recognizable clinical kwashiorkor.

An even broader and more prevalent gross malnutrition in infants and pre-school children is the condition of marasmus, widely understood to signify infantile atrophy resulting from semi-starvation. This malnutrition is more strictly a lack of calories, but also associated with insufficient intake of protein and usually with infectious diseases. The economic loss represented by the excessive death rates and physical impairment resulting from protein-calorie malnutrition in early life is difficult to estimate. Aggressive steps are being taken by many groups, particularly the U.N. agencies, to correct this appalling morbidity and mortality.

One of the most significant developments is the evaluation of suitability for infant and child feeding of vast quantities of protein concentrates, such as groundnut flour, cottonseed meal, and other presscakes and fish flour. The proper combination of such concentrates with appropriate cereals and other ingredients readily available in countries can result in the preparation of a cheap, acceptable, and nutritious foodstuff which can be produced locally. For the past seven years a large programme of study, evaluation, and development has been under way, sponsored jointly by the U.N.I.C.E.F., F.A.O., W.H.O., and other agencies, particularly the United States Food and Nutrition Board and the Rockefeller Foundation. This programme is now culminating in the appearance of products such as the *Incaparina* evolved by the Institute of Nutrition for Central America and Panama in Guatemala which has proved not only beneficial in the nourishment of healthy infants but curative in severe cases of kwashiorkor. At the same time *Incaparina* is widely acceptable and economically feasible for production and distribution by private enterprise in Central America.

Similar developments may be expected in many places.

Avitaminosis A. Within somewhat the same age group as kwashiorkor one encounters the severest manifestations of vitamin A

deficiency—xerophthalmia and keratomalacia—which frequently lead to permanent blindness (or death). From one area of Java (Semarang) 2,200 cases were seen in a recent year—and in one eye hospital in Jogja 10,000 cases were recorded over a ten-year period. Night blindness, a less malignant and earlier manifestation of this deficiency, occurs among older children and adults along with other manifestations. Patwardhan states that avitaminosis A is 'probably one of the principal causes of preventable blindness in India and in Southeast Asia'. Surveys reveal 5–10 per cent. of Indian children affected with hypovitaminosis A.

Oomen after many years of practice in Java wrote in 1958:

Xerophthalmia has been the most bitter pill for me to swallow during 18 years of doctor's work in Indonesia. The over and over repeated experience of discovering a child, recently blinded, in the arms of the mother; having to tell her that I now could do nothing more to save its eyesight; remembering that I could have done so with a few spoonfuls of cod-liver oil some days ago; these things still enter my nightmares. They belong to the most vivid examples of what disprivileged people in underdeveloped regions sometimes miss.

Now what do I find in textbooks and scientific publications if I want to have real information about this horrible, though easily curable condition? Textbooks on tropical diseases tell you everything about Rift Valley fever, melioidosis and blastomycosis, but they sometimes do not spend one word on xerophthalmia. Every nutrition journal flows over with vitamin A, for instance, in heifers, turkeys and ducks which are eaten by the best-fed people of the world. More printing space nowadays is devoted to a few cases of hypervitaminosis A, induced by an irresponsible vitamin racket, than to the thousands of small children who die or get blind every year due to the lack of a handful of vitamin A units. What on earth is nutritional science good for, if, even in the atom age, it is not capable to counteract one of the foulest consequences of bad nutrition? Do you realize that since the days of Mori, 60 years ago, not in Japan, but in countries like Indonesia, not one step forward has been taken, in spite of a mountain of thoughtful attention paid by doctors?

By thus sharing with you his feelings I hope to emphasize the urgency and the importance of this problem—and the frustration of the nutritionist who sees so clearly the method of prevention of this horrible and tragic condition, who understands the insignificance of the cost of prevention, but who can create no interest nor activity on the part of governments in the institution of preventive steps.

Beriberi. Beriberi is due to a deficiency of thiamine (vitamin B₁) and occurs especially among populations which subsist on a diet primarily of highly polished rice. The post-war increase in Thailand and

the simultaneous decrease in Indonesia may be correlated with changes in milling practices which result in altering the amount of thiamine removed from the rice grain during processing. Par-boiled rice—a rice processed to retain thiamine—has long been known to prevent beriberi. Enrichment of highly polished rice with synthetic thiamine is likewise an effective and economical preventive measure. Despite this understanding the disease continues as a major cause of death among infants between 2 and 5 months of age in Thailand, Burma, and Vietnam.

Again, the physician and nutritionist are helpless alone after the diagnosis is made—the aid, support, and action of others are essential in order to institute corrective procedures.

Pellagra. Just as beriberi is associated with the consumption of a rice-based diet, pellagra is usually associated with a diet primarily of maize (corn). The symptoms of dermatitis, oral lesions, diarrhoea, and even mental changes which occur reflect deficiencies of niacin and of the amino-acid tryptophane. Vilter and I, in an epidemiologic study in Egypt, found that pellagra may appear among populations in which more than 60 per cent. of the cereal diet is maize. Conversely, the disease is prevented by increasing the non-maize calories through a greater consumption of wheat, millet, or several other foodstuffs. A study with which I was associated as a consultant for the W.H.O. in Yugoslavia demonstrated that the enrichment of maize meal with a vitamin mixture containing niacin prevented the disease among those consuming the enriched meal. The incidence among families not consuming the enriched meal remained unchanged. Pellagra can be erased by shifting agricultural production and distribution of cereals in a country in such manner as to provide a mixed diet for all segments of the population or by enrichment of cereals. At the present cost of niacin in the U.S.A. the ingredients for supplying a generous intake through enrichment would be less than 4 cents per year per person.

The case for nutritional planning in the face of acute problems such as these I have mentioned is clear. Equally clear, if less dramatic, is the need in many situations in which one does not encounter frank deficiency disease. An example of this type of situation is the instance of the Navajo Indian on the Navajo Reservation in Arizona, U.S.A. Here an intensive survey revealed the non-existence of frank deficiency diseases, and only in the instance of ascorbic acid was there an indication (dietary and blood studies) of widespread insufficiency. Suggestive evidence of ariboflavinosis existed. It was found that the Navajo had abandoned his primitive diet. He no longer depends on

the hunt, on Indian corn, gathered wild plants, berries, and fruits for his food. He combines home-produced meat and a few other products with flour, shortening, coffee, potatoes, sweets, some milk, and fruits with a limited variety of foods purchased at the trading post. The findings indicate a need to enhance production and consumption of fruits and vegetables, and of milk. They also emphasize the importance of preserving certain of the traditional food practices—e.g. consumption of visceral organs of home-slaughtered animals, consumption of potatoes—as the Navajo makes the transition from the self-produced diet to the processed food of the trading post and supermarket.

In closing, again I quote the U.S. Food and Nutrition Board:

In many of the developing countries of the world malnutrition exists as protein and various vitamin deficiencies, goiter and other diseases caused by lack of specific nutrients. Also, there is under-nutrition resulting primarily from a lack of sufficient calories where people just do not have enough food. Impaired growth and development, lowered productivity, decreased resistance to stresses and shorter life spans result. All of these troubles can be prevented by an appropriate food supply accompanied by a supporting educational program. This does not necessarily call for a supply of the kind and variety of foods available in the United States of America, for there are many ways of getting an adequate diet. It does require a food supply geared to meeting the nutritional needs and food customs of the population in question and which can be most effectively provided by the agriculture of the country and by economically justified imports.

In developing countries where productivity depends so largely on manual labor the nutritional status and health of the workers are paramount in determining the economic output. Under-fed people are not only less productive, they are also more prone to the ravages of infectious diseases. Sick people weaken the economy by requiring community and government assistance instead of supporting themselves and contributing to the country's output of goods and services.

Malnutrition creates political unrest, for an adequate diet is a real necessity for a satisfying existence as well as for health and productivity. Government policymakers, in planning for economic development, should recognize that the nutrition and health needs of the country's population should have top priority. These basic needs should be scrupulously considered in any program for industrial development or agricultural production for export.

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C. VON DIETZE, *University of Freiburg, Federal Republic of Germany*

My task is to focus our thoughts on the economic problems of the theme 'Health and Nutrition'.

Economic activity is the sphere of human life which has to provide our bodies with all their needs, but first of all with food. Therefore all questions of nutrition have an economic aspect, both for consumptive and for productive purposes. Nutrition keeps us alive, and right nutrition keeps us in good health. At the same time it enables us to work productively, the kind of nutrition required depending on the duration and kind of work.

Physiologists as well as economists need a true picture of the state of nutrition. Food 'budgets' already worked out for a good many countries give information, not complete however, on the average consumption of foodstuffs. In many cases they have been refined by household surveys of different income groups, or in other ways, and show which parts of the population are above the average, which are on the average, and which remain behind, sometimes considerably behind. The urgent problems arise where under-average nutrition does not come up to the requirements of health.

Health depends not only on a sum of calories, but on a right composition of carbohydrates, fats, and proteins, supplemented by vitamins, minerals, and trace elements. Very often, proteins are insufficient, and for satisfactory nutrition it is important to know whether, and to what degree, animal protein is indispensable or can be replaced by vegetable protein—e.g. dairy milk by soya milk. This question has high economic importance, for if plants are used for forage about 8 per cent. of the calories are lost.

Education, the importance of which has been stressed during this Conference, is also an essential requisite for sound nutrition. It leads not only to the proper choice of a healthy diet, but also to such things as cleanness in the preparation and consumption of food. In many countries governments have prohibited the production and sale of dangerous narcotics, and special laws have determined which substances may be added to food. There are numerous regulations controlling quality, such as govern the inspection of butcher's meat, or hygienic processing, e.g. the pasteurization of milk. But that is not enough, particularly for an illiterate population. A question which has to be under continual examination is the type and duration of education needed in any particular situation, whether it should be by general information, by special courses for housewives and young people, by boarding establishments, or by unified development schemes, &c.

Here, the difficulties of making the right choice and of the proper application of the means of education are even greater, perhaps, than for the production of food. For the preparation of food the housewife as a rule is competent, even more so sometimes than in other decisions of daily life, though she may give an impression of resisting innovations more than men do.

Substantial changes in methods of production tend to require new kinds of nutrition. A thorough investigation which we have accomplished recently in two rural districts of Western Germany shows that in the more remote districts many people suffer digestive disorders not because of under-nutrition but because of mal-nutrition. Although the agricultural work has been mechanized to a high degree, the nutrition remains as ample and as heavy as before.

In dealing with nutritional problems we have to look beyond agriculture. The industrial processing of the commodities produced by agriculturists is becoming even more important. This calls for a proper relationship between the prices which the farmers receive for the raw materials and the prices charged for the finished products.

If, as has happened during the gradual realization of the Common Market, duties on finished products of the processing industries are lowered at a faster rate than they are on the raw materials coming from agriculture, there will be great difficulties.

I have touched on the field of nutrition policy already, and I shall not dwell on cases where hygienic aspects serve as a pretext for realizing protectionist aims. Anyway, nutritional problems play a considerable part in political economy. For this purpose three different types of food-budget come into question. The first merely shows the state of nutrition in total or for different groups of the population. The second ascertains the quantities of food available for distribution, if necessary by rationing. This is used primarily in a situation when, by blockade or by shortage of foreign exchange, imports of foodstuffs are reduced. The third can be illustrated by the legislation of my country. Every year the administration has to present plans for supplying the population with grain, sugar, and meat. According to these plans, the Transport and Storage Board receive their instructions. The Grain Law was the first. It says that the quantities of grain 'which are needed for feeding the population' are to be ascertained. The Sugar and Meat Laws came later. Their criterion is 'to cover the demand', i.e. to match the purchasing power. This third type is applicable only to States whose economic order is orientated on market processes, and which are not facing famine and do not even have low-income groups in the population. But even in such countries, the economic policy often aims at facilitating the purchase of sufficient food. For example, the prices of essential foods are kept low, or 'food stamps' are granted, as in U.S.A., or priority is given for certain provisions, as it was for a time in Germany for frozen meat. School meals should also be mentioned, quite apart from their educational importance.

Wherever a market economy prevails the elasticity of demand for foodstuffs must be taken into account. What reactions of demand are to be expected if prices or incomes undergo changes? On these problems we have such an abundance of studies from many countries that it is sufficient just to mention them, as well as the law formulated by the German statistician Engel a hundred years ago.

International problems of nutrition have been of growing concern since the days of Malthus. Before then men in one part of the world hardly knew that many thousands were suffering or even dying from hunger in other parts. And even if they knew, they could not help. Since Malthus the question has been raised again and again whether sufficient food can be produced in the world for a rapidly growing

population. The pessimistic forebodings of Malthus were soon outstripped by technical progress. Although, in 1898, Crookes predicted great nutrition difficulties for the middle of the twentieth century, more optimistic views prevail at present. During our Conference the opinion that we shall have to face surpluses of food for a long time to come has not been contradicted. But great differences exist in the regional distribution of food production. In industrialized countries, with the exception of Great Britain, production has kept pace with the growth of population even with the recent rise of living standards. In U.S.A. the surpluses are an urgent problem. In Europe serious consideration is given to the question of imminent surpluses.

In most agricultural countries severe famines have become rarer, in spite of rapid growth of populations. Consequently food production as a whole must have increased at least at the same rate as the population. As Dr. Sen's figures show, an appreciable improvement of nutrition *per caput* is to be noticed in India. The same applies to Mexico. In other countries the picture is less favourable. Improvement is urgently needed from the economic as well as the physiological point of view.

It is remarkable that in the well-fed countries, where some people jeopardize their health by excessive consumption of food, more and more men are feeling a responsibility for helping to overcome the nutritional needs of other countries. The Biblical question, 'Who is my neighbour?', is answered in a way which differs from that of a hundred years ago, although not yet fully corresponding to Christian or humanitarian ethics. Anyhow, sufficient help for underfed nations or groups of people is the demand not merely of some philanthropists; economists are intensively devoted to finding out the best possible means for such help. Our whole Conference demonstrates it. It has made us look at the general lines of economic development. May the discussion which follows add valuable contributions to the subject.

F. STANGEN, *Germany*

Further to Professor Darby's medically orientated paper and Professor von Dietze's presentation of the general economic problems involved, I should like to underline the correlation of human nutrition and hygiene with the over-all economy of a farm.

The agriculture of economically developed regions may be orientated entirely towards cash crops, since the households are able to buy foods on the market more economically than they can be

produced on the farm. In regions which have reached an intermediate stage of economic development, part of the human food needed on the farms is produced there and the remainder is purchased on the market. The early stage of classical agricultural development is marked by subsistence farming.

The agriculture of economically less-developed regions is in its early stage of development so far as labour productivity is concerned. Owing mainly to the influence of the requirements of industrial countries their farm economy varies. For example, in many parts of Latin America it deviates from the classical pattern of early agriculture in favour of cash crops—in many cases even of mono-culture of such crops. The income from these cash crops, however, does not suffice to purchase sufficient food (including protective foods) at the market. Since this, no doubt, is of essential importance to the farm families involved, the need to produce sufficient food for home consumption should be taken into account by those engaged in the farm management problems of the regions concerned, as is the case with animal feeding stuffs.

To the extent that the provision of sufficient fodder for livestock is not regarded as a responsibility of associations dealing with the protection of animals (*Tierschutzverein* in German), the supply of food to farm labour should not be considered a matter to be handled principally by public health authorities and welfare agencies. Apart from the ethical aspects, both cases involve an economic problem the solution of which should be tackled by the agricultural economist dealing with farm management. This has not yet become a generally accepted responsibility. For example, agricultural extensionists in large parts of Latin America direct their efforts exclusively to increasing the farmers' cash receipts in spite of the fact that producing sufficient food for home consumption rather than raising cash receipts may be more economic in view of the health and the standard of living of the agricultural population concerned.

W. J. DARBY (*in reply*)

I am pleased, indeed, to hear the emphasis on hygienic quality control. Certainly this needs to be immediately recognized by all of us who have had the responsibility for advising on programmes in many of the developing countries. This is related directly to agricultural betterment because of the impetus it gives to an agricultural economy which puts emphasis on quality.

The discussions this morning concerning change and the mention

this afternoon that women are more difficult to change than men, although they are supposed to change their minds very frequently, reminds me that about one year ago F.A.O., W.H.O., U.N.I.C.E.F., and the International Institute of Mental Hygiene in collaboration with one of our Foundations held a conference in this hotel, I believe, on the subject of the cultural anthropology and sociology of food habits. This was an effort to find means of effecting changes in food habits to improve nutrition. Nutritionists, agricultural economists, all of us, are struggling for the same answers, and I fear that, when we have finished and given our advice, we must do as our friend Mr. Aziz suggested, and leave it to the people on the ground to solve the problem.