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The Economist and Farm People
in a Rapidly Changing World

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OPENING STATEMENT

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BEFORE looking at what the authors of the four main papers have had to say and what it might mean for us and our work as agricultural economists, let us look at the theme itself.

'The Economist and Farm People . . .'. Why not 'The Farm Economist and People . . .' or 'The Farm Economist and Farm People . . .' or 'The Economist and People . . .' ? All these are minor variations, each with its attractions of emphasis but the very differences (farm economist *v.* economist; people *v.* farm people) merely serve to emphasize that the major considerations for us are really 'economists' on the one hand and 'people' on the other.

But why ' . . . in a Rapidly Changing World' ? On the surface, all four of our main papers emphasize change in the world, change centred around population size. But are we in a rapidly changing world ? I do not think so, at least not to the extent that we offhandedly tend to think. People are still people—and we will not change that. Too few are well off and too many are badly off—and that is not changing. Wars are still keeping pace with technology and in general the world remains of no great credit to man—and looks like staying that way for some time yet. So, on a long broad view, I do not think 'a rapidly changing world' is all that evident. Indeed, the real problem is that we do not have a world rapidly changing the way we would like it to. But all that is merely arguing about words.

What did our four main speakers have to say ? Professor Borrie's major points, I feel, were:

- (i) At the minimum, world population will have approximately doubled by A.D. 2000 and, because of differential birth-rates, there will be a considerable shift towards a higher proportion of world population living in today's developing areas, as indicated by his Table X. Major problems will be in the areas of food supply and urban development.
- (ii) The pace of population growth is too fast to be solved by investment in agriculture alone: population control is needed.

- (iii) Birth control is the only 'dignified' form of population control.
- (iv) At first sight, the prospects for fertility control appear poor, but examples indicate that when motivation is strong, sudden and substantial falls in birth-rates can occur.
- (v) Effective world birth control implies control in China, India, and Pakistan.

Over-all, I found Borrie's assessment a sober one, neither too pessimistic nor to optimistic. In contrast, I found the tone of Dr. Bawden's appraisal too optimistic. For him, future prospects are rosy so long as population is controlled and modern farming methods are introduced, the problems in doing these two things being sociological and economic rather than scientific and technological. One can hardly disagree violently with this. But what if the assumptions of successful population control and the use of modern farming methods do not hold? Bawden's three other major points, I thought, were:

- (i) If food demand outstrips supply, the implication is that knowledge of how to produce more food has not been fully used—a thought which I find too simplistic but not atypical of a technical rather than an economic orientation.
- (ii) Adaptive research is needed in the developing countries to enable basic principles established by agricultural research in the developed countries to be used effectively.
- (iii) The application of science to agriculture is relatively recent. Much greater scientific advances are still possible and to be expected.

I found Professor Kristensen's paper a far more solid one—well organized, well argued, and objective. Every paragraph demands close reading. One can hardly do his analysis any sort of justice by a short summary.

Taking A.D. 2000 as his point of future reference (and based on population projections consistent with Borrie's, so far as I could ascertain), Kristensen suggests that:

- (i) A reasonable projection of food supply and demand implies that by A.D. 2000 the *D.C.s* would be net exporters of food to the extent of 18 per cent of their production and 20 per cent of the *L.D.C.s* consumption.
- (ii) If food production and trade follows such a projection, the implications for farm people are that there will be two worlds (*D.C.s* and *L.D.C.s*) that will be very different for a long time to come. In the *D.C.s*, agricultural population will fall both absolutely and relatively by A.D. 2000, and there will be fewer but larger farms using scientific management with intensive use of capital. In the *L.D.C.s*, agricultural population will rise by some 60 per cent in absolute terms but decline as a proportion of total *L.D.C.* population.
- (iii) In terms of agricultural policy implications, assuming the major goals to be higher living standards in the *L.D.C.s* and reduction of

the income gap between farm and other people, for the *L.D.C.s* there should be a 'suitable' environment for development—implying the development of agro-allied industries for new input production; the provision of research, education, and advisory services; non-agricultural work opportunities for surplus farm labour; and a recognition that self-sufficiency in food may not be economic. In particular, a high priority should be given to the generation and distribution of knowledge, especially from adaptive research. As well, via the tenure and price systems, farmers should be given incentives to produce efficiently. For the *D.C.s*, relative to the *L.D.C.s*, the major policy implication is that they should supply aid, especially via basic research and training for adaptive research. So far as possible, tied aid should be avoided.

- (iv) With respect to trade policy between the *D.C.s* and *L.D.C.s*, import of food by *L.D.C.s* implies they must have access for exports to *D.C.* markets.

So much by way of a very inadequate summary of Kristensen's outstanding paper. At least his paper is treated no worse than Professor Bićanić's.

At first reading, Bićanić's paper was quite incomprehensible to me. By the third reading I was understanding and enjoying it, though perhaps not appreciating it as much as Bićanić would like.

The kernel of his paper is his Table 1 giving a synoptic view of types of agriculture. As a generalization of operational significance, he suggests four types of agriculture—subsistence, marketing, entrepreneurial, and contract or planned—characterized respectively by agricultural policies of life parity, price parity, income parity, and technical parity. These policies are postulated as being causally dependent in a national context upon the rates of change of the agricultural population in absolute terms and relative to total population. For each type of agriculture he specifies an upper and a lower 'critical policy line'; the upper being the situation beyond which the government will make transfers against agriculture, the lower being the situation below which the government will make transfers in favour of agriculture.

What of the four papers as a group? Given the authors' terms of reference of reviewing the findings and prospects in their separate fields, I do not think the papers could fit together any better than they do—which is not greatly in terms of 'What should we now do?' At least there are no major inconsistencies between the papers—though there might be if Bićanić's synoptic schema was used as a basis for projecting the supply and demand situation in A.D. 2000 for comparison with Kristensen's estimates. Borrie, Bawden, and Kristensen all go some way in suggesting—according to their lights—what should be done. In contrast, Bićanić's analysis (which seems to be mainly Bićanić rather than political science in general) is more of a descriptive snapshot through his personal lens. As such it is original and stimulating, albeit arguable both in its deterministic

movement through subsistence to planned agriculture and in its descriptive categorizations. But it does not take us far, in my judgement, in terms of specifying policies or instrumental variables by which to speed the sequential pattern of development. For sure, it postulates absolute and relative changes in agricultural population as the causal key in a long-term sense, but the importance of population change is already well recognized professionally.

Over-all, apart from the general and already well-appreciated maxims of 'reduce the population growth rate' and 'increase food availability', the papers as a group are well short of being fully prescriptive at either the broad world-wide macro level or the intra-national macro and micro levels. This is not to blame the authors—with the orientations and time available to them it would have been impossible to do the complete ideal job of diagnosis and prescription. At the same time, by contrast, I think there is far more meat for prescriptive argument and suggestions for policy in, for example, the recent slim volumes of Galbraith, Heady, and Schultz.¹ These authors, whether we agree with them or not, make strong operational suggestions as to how economists might best move to solve the problems of 'farm people in a rapidly changing world'.

One obvious implication of our theme survey is that for a long time to come there should be no shortage of work for agricultural economists. The problem will be to ensure that this work is as well directed as it might be. This implies professional concern at two levels—in the training of agricultural economists and in the on-the-job approaches and orientations of agricultural economists. Given that economics is a science generating basic principles, indifferent to geography, for use in applied fields such as agriculture, a distinction is still pertinent between the applied training necessary for working in the dynamic agricultural situations of the *D.C.s* and the stagnant agriculture of the *L.D.C.s*.

In the *D.C.s*, with injection of new technology into the system operating automatically, the production problem is largely one of ensuring the best use of given resources under a dynamic technological regime and devising policies aiming at a non-artificial equality of income distribution. In the *L.D.C.s*, in contrast, at both the micro and macro levels, a major problem is to get the technological engine working—rather than a problem of getting to the top of the current highest mountain, it is a question of finding better mountains to climb because the *L.D.C.* system does not seem geared to jumping from mountain to mountain itself. In this sense, therefore, I feel that for the *D.C.s* investment in finely detailed planning analyses of analytical orientation, both micro and macro, can be worthwhile. But not for the *L.D.C.s*—for them at this stage it is broad manipulations that are needed rather than fiddling around with marginal details. This is not to say, for example, that publicly sponsored farm-management

¹ J. K. Galbraith, *The Underdeveloped Country*, Canadian Broadcasting Commission Publications, Toronto, 1965. E. O. Heady, *Agricultural Problems and Policies of Developed Countries*, Bondenes Forag, Oslo, 1966. T. W. Schultz, *Economic Crises in World Agriculture*, University of Michigan Press, Ann Arbor, 1965.

extension services are not needed in the *L.D.C.s*—they will be needed but they also need a new or more suitable environment in which to operate rather than their traditional farm-management milieu. In contrast, though, I see no reason why farm-management advisory work in the *D.C.s* should not become more and more a commercial operation carried on by factor suppliers, product purchasers, and private advisers.

But no matter how well done the work of agricultural economists may be, it will be negated by the influence of population growth to the extent that births remain uncontrolled. Too much, I believe, agricultural economists have seen the 'population demand versus food supply' problem as one to be solved by increasing food supply rather than by slowing down population demand. If population were the only available instrumental variable in the situation, what possibilities would be *technically* feasible? I believe there are three in the short run: to decrease births, to increase deaths, or to shift population geographically between nations. In the long run, geographical shifting of population would not be an effective measure. In the short run, because of social and political considerations, it is typically infeasible on a meaningful scale but is a policy that might be imposed militarily.

Recognition of birth control under its various headings—pills, loops, vasectomies, economic incentives, legal sanctions, etc.—as a policy variable is gaining increasing attention. But so far it has not received much attention from agricultural economists. Here, I believe, there is a substantial field of much-needed research—at the level of the *L.D.C.* farm household, what are the costs and benefits of birth control? What are the discrepancies between private and social costs and benefits? After all, intercourse is a central element of the farm-household complex. On the surface it would seem that for the average farm worker in the *L.D.C.s*, children are a net economic benefit in terms of work-help and old-age insurance. But is this really so? We need facts and analysis. Likewise, for such people intercourse undoubtedly plays a very substantial recreational role. For many, indeed, it is probably the only piece of joy in the day. Galbraith¹ puts it well:

In the poor country . . . if the standard of living seems already as low as it can go, there is no reason to protect it from further decline. And children will share the burdens of manual toil and, since old age pensions cannot be afforded, they are also a man's only hope for care in his old age. It is prudent to have as many as possible for, infant mortality being high, not many will survive. Nor is there much choice, for neither contraceptive knowledge or contraceptives are available and—a somewhat neglected point—sexual intercourse plays a larger recreational role in the poor community than the rich. For the couple who come from the field to a hut devoid of newspapers, radio, light, even a comfortable chair, it may provide the day's only escape from a grey existence. To urge restraint is to leave very little in life.

To what extent then can appeal to restraint without incentives be successful? What is the elasticity of response to various incentives or disincentives? And so on. This whole area, I suggest, is one to which

¹ Galbraith, *ibid.*, p. 5.

agricultural economists (in conjunction with demographers, sociologists, and others) might well give much attention in the *L.D.C.s.*

Just as much as birth control, agricultural economists have ignored the assessment of death control as a policy variable. Heady¹ puts the problem this way:

A society which invests first in steel mills and international airlines, typically operated at a deficit, but lets population surge forward to provide more people pressing heavily and in extreme misery against food supply, is as guilty as ravaging dictators who simply line healthy people up against walls and shoot them. It is yet to be proven that quick death of well-fed people in this manner causes any more, or as much, misery or disutility than an increase in masses of people who are faced day-in and day-out with misery from insufficient food and health facilities. Of course, intelligent humanists abhor either of these types of individual misery and injustice.

... it is obvious that population cannot go forward forever unchecked. Present rates of increases would soon absorb all of the untapped food producing potential of both developed and undeveloped countries. Then, when the final restraint of food production were reached, there would be even greater masses of people to starve or live in hunger and misery. Human disutility and suffering would be multiplied and the negative effect could well be greater than if excess food stocks were withheld as a check against population growth. Ethical questions even arise as to whether societies should provide more and improved health and medical services which decrease mortality rates, without parallel investments and intensity to increase food supply for the greater number of persons who are thus kept on hand to consume.

Such comments and questions are sure to come into prominence. From an economic point of view, what are the answers? What would be the economic costs and benefits of policies aimed at holding back health and medical services so as to prevent the mortality-rate from further falling out of balance with the birth-rate? Would the costs to production of a debilitated work force outweigh the gains of a reduced population increase? To what extent can we compare present and future aggregate utilities? All these are difficult questions—economically, politically, and morally. But if success is less than adequate on the food-supply and birth-control fronts, our confreres at the 26th International Conference (Armidale, A.D. 2000) could well be grateful if some research had been done in these areas

OPENING STATEMENT

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WE have met to discuss the situation in which farm people find themselves today and the problems that they are likely to face in the next few decades in a rapidly changing world. Attention is drawn particularly to two sets of external factors inducing rapid change: demographic pressures

¹ Heady, *ibid.*, pp. 142-4.

² In the unavoidable absence of Dr. Gadgil the paper was presented by Dr. S. R. Sen whose personal observations on the theme follow on p. 171.

and scientific progress. The world is changing rapidly and rapid change will continue to characterize the future for many decades. However, the direction of change and the problems arising out of change will not be the same throughout the world. The situation in the developed economies will be very different from that in the under-developed economies and it is the latter which causes grave concern. Therefore, discussion has to centre mainly round trends and possibilities in the under-developed economies.

Over thousands of years in the past the population of the world grew very slowly as a result of the very narrow difference between rates of fertility and mortality. There was no breakthrough from subsistence levels and the ravages of disease until almost the contemporary period. The modern phase began in Western Europe and was associated successively with such events as the colonial expansion of the peoples of Europe, the Industrial Revolution and the progress of science, especially in relation to medicine and public health. These led to a steady fall in rates of mortality and continuously raised the expectation of life at birth. However, because of a number of factors, there was no population explosion. The most important limiting factor was perhaps the widespread attempt at control over fertility which began early in the nineteenth century in some European societies. The decline in rates of mortality and the effective control of fertility have been continuous, somewhat parallel, movements in Western Europe over the last two hundred years. Both have been associated with industrialization and urbanization. With the present low levels of mortality it is only the efficient and widespread control of fertility that prevents the attainment of fantastic rates of growth in the West.

The non-European world continued to have high rates both of mortality and fertility for most of this period. Even so, population increased significantly during the period, particularly in Asia. However, from 1750 to 1930 Asian population increased less than 2.2 times while population of European origin increased five times. The situation has undergone a radical change since 1930. During the last three or four decades remarkable advances have been made in public health and sanitation and these have been rapidly adopted in most parts of the world. As a result extensive and expanding controls over mortality have been established in the 'under-developed' part of the world. Fertility yet remains substantially uncontrolled and this has given rise to grave apprehensions regarding a population explosion. Rates of infant mortality have fallen and expectation of life at birth has increased spectacularly in many under-developed countries since the thirties. It has been calculated that if recent trends of birth- and death-rates continue the world's population will grow from 2,990 millions in 1960 to 7,410 millions by the end of the century. The larger part of any projected growth will take place necessarily in the under-developed countries and could mean an enormous, almost unbearable, pressure of numbers against resources.

Control over mortality has become relatively inexpensive and simple and is related largely to action by public authorities. The downward trend in rates of mortality in the under-developed countries will, therefore,

continue. The only way of containing the grave dangers of a population explosion is for these countries to aim at reducing fertility. Control over fertility is essentially related to behaviour of individuals. In the West, demographic controls, economic development, industrialization, urbanization, spread of literacy and education have all progressed side by side. However, it cannot be taken for granted that the pattern of events that evolved in the West will necessarily repeat itself in all under-developed countries. Even in the West, control over fertility has been specially in evidence when individual motivation has been strong and recent experience in Eastern Europe and Japan indicates that where motivations are adequate quite sudden and revolutionary changes can occur in rates of fertility.

Possibilities of control of fertility also depend on available methods of birth control and their suitability to the illiterate and overcrowded people most needing assistance. However, recent progress with relatively simple and cheap devices appears to hold promise of a solution of difficulties in this regard. Individual motivation, therefore, assumes supreme importance. In many under-developed countries the approach of people to the question of birth control is relatively rational as seen, for example, in the quite extensive use of male vasectomy. Also, governments in a number of these countries have, during very recent years, embarked on large programmes concerned with family planning. Nothing can be said today regarding the possible effectiveness of these programmes. However, all evidence points to the possibility of very rapid decline of birth-rates where public policy and individual motivation act together.

It is estimated that if very substantial reduction in fertility takes place in under-developed countries, the population of the world in A.D. 2000, will be 5,965 millions instead of the projected 7,410 millions. Even so the population of Asia, Africa, and Latin America in A.D. 2000 will be more than double that in A.D. 1960. Also, whatever the course of future fertility the numbers of young people coming of working age will, during the next fifteen years, increase greatly in most under-developed countries. This will raise problems not only of absorbing large numbers in agriculture, but also of moving increasing proportions into non-farm employment. Their solution will demand, among other things, large investment resources for relocation of economic activity and of labour and for education and occupational training.

The implied transformation of simple societies of primary producers into complex industrial societies will call for revolutionary changes in the techniques of agricultural production and the structure and attitudes of agricultural societies. The possible route and pace of these changes have to be considered against the background of demographic movements sketched above.

In this context, it is important to note that other factors cannot in any real sense be substitutes for land and that today there are no new continents left to explore. The expansion of Western man has filled up the empty spaces of the world and the people of the under-developed

countries are effectively barred from participation in occupation of such spaces in the possession of Western men as are not so full. From this point of view also the world is divided sharply into two groups and the growth of population in the under-developed countries has to be contained fully within their own territories. In all these countries a majority, large or small, of the work-force is at present employed in agriculture and opportunities of non-farm employment are restricted. The expected rapid increase of population during the next two decades will, therefore, have to be absorbed to a large extent in agriculture. Inevitably, the area of land surface per head of population and also per agricultural worker will diminish significantly in these countries within the coming decades.

The extent to which this will happen will depend on a number of variables, any definite estimation in relation to which is very difficult at this stage. However, attention may be drawn to certain relevant considerations. The diminution of land per worker can be compensated for only by greatly increased productivity; the latter is related to increase in non-agricultural activity, employment, production, and demand. The expansion of such activity will require additional land for industry and for urban growth. Even more importantly it will require significant proportions of available land surface to be put under non-food crops. Industrial growth in the under-developed countries will necessarily have to be based on increased primary production within their own territories.

The above brings to the fore immediately the problem of food supply. Given the demand for alternative uses of land in an industrializing society can the remaining land surface under food crops feed effectively the rapidly increasing numbers? The problem can be looked at from two points of view. In the first instance as a problem of world food supply and secondly as of food self-sufficiency for each large under-developed country. In spite of some alarmist views the consensus of scientific opinion appears to be that existing knowledge regarding application of science to agriculture has not yet been fully utilized even in the developed countries and that there is scope for much further progress. Also, the trend in developed countries will be in the direction of a continued movement of labour away from agriculture till, with increased application of capital and improved technique, output per worker in agriculture approximates to that in non-farm work. A number of developed countries will then be in a position to produce large surpluses of agricultural produce. Ordinarily, most of this capacity may be utilized in animal production. However, if increased demand from developing countries raises international prices the capacity could be utilized in cereals production.

Whether individual developing countries will attain self-sufficiency in food will depend on their size, the structure of their economy, and the route and pace of their development. It would be neither profitable nor important for small countries with highly specialized agricultural production to attempt to attain self-sufficiency in food. For countries with a large population and diversified agriculture, basic self-sufficiency may prove important. Because, in its absence their demand for food imports may

become so large that it could not be met through the normal functioning of the international economy. Dependence on particular countries arising out of this situation would distort their economic and political development. Food self-sufficiency may, therefore, be incorporated in the objectives of development programmes of these countries.

Success in this direction will depend essentially on the pace of over-all developments. Economic development is indivisible. Transformation of semi-subsistence agriculture into a fully commercialized enterprise requires the creation of an integrated economy with a transport network reaching into all areas and widespread systems of water and power supply. Moreover, it requires education and technical training, and in so far as the transfer of these from outside is much easier in industry and the towns, the establishment of industrial and urban centres is important for technical progress in agriculture. Technological progress of Western agriculture was closely associated with urban and industrial growth and the resulting scarcity of rural labour. The demographic prospect lends special importance to immediate industrial development in the under-developed countries. A simple arithmetical calculation would illustrate this. Given an existing ratio 65:35 of farm and non-farm employment and the prospects of doubling of the work force within the next four decades, non-farm employment would have to increase at least threefold (from 35 to 105) to ensure less than 50 per cent increase of numbers on the land (from 65 to 95). In view of the high costs of development of large metropolitan centres and the difficulties attendant on large transfers of population with an under-developed infra-structure it would be highly desirable that this industrialization be as widespread as possible. Not only the establishment of agro-allied industries but also rural industrialization in general becomes thus another important objective.

The needed increase in agricultural productivity and the implicit transformation of agricultural society confront, in the main, two sets of problems. The first relates to transfer of technology. In part, this depends on the spread of literacy and of primary, secondary, and technical education. However, for the greater part it calls for adapting to local conditions methods already well-established elsewhere. This is a complex and difficult task which has been relatively neglected. Soils, climates, and crops differ greatly in different countries and in different parts of countries and practices proved beneficial in one context may even prove harmful elsewhere. Similarly, different plants differ in their ability to tolerate drought or in the amounts of individual elements they need. Fertilizer requirement again is not a fixed amount per acre for a particular crop but differs greatly according to circumstances. Improvement of agricultural practice thus requires knowledge not only of general principles but also of local conditions. And the latter can be obtained only through continuous and extensive local experimentation.

The other set of problems are related to the structure and policies of governments and the response of societies. Conditions in this regard are so diverse as to preclude generalized statements. However, the types of

problems encountered may be indicated by relating them to motivation and organization. Assuming that the peasant family will continue to represent the main type of production unit, two vital factors in motivation will be tenure arrangements and pricing policies. The structure of government will initially determine the first. A plantation or estates economy could achieve the breakthrough in productivity. However, with the large numbers necessarily retained on land, such economy may prove socially and politically unstable. Absorption by the individual peasant of advanced agricultural technology and its constant rational practice will also necessitate general assurance of fair tenurial terms.

In a market economy, pricing policies will have great importance. These will be related to a series of different considerations such as the urban cost of living, procurement of agricultural supplies, the desired cropping pattern, and the level and stability of agricultural incomes. The pressure on land and the need to encourage transfer into non-farm employment will keep returns to agriculture relatively low in developing societies. However, elimination of exploitative elements and maintenance of stability should prove practicable and are essential.

Already, large proportions of farming units in many developing countries are sub-standard. Pressure of population will diminish size still further. Transfer of technology to sub-standard units proves very difficult and pooling land to increase the size of units is a constant concern. State farms, communes, and co-operative farming are different possible approaches. The Japanese solution of constantly increasing the intensity of land exploitation and providing ample employment opportunities in the countryside for farm families is rarely possible. Therefore, local experimentation to evolve organizational types which will attain economic size and yet retain motivation is an urgent continuing requirement.

Existing units in even commercialized agriculture in developing countries tend to be weak and exploited. They cannot achieve technical progress without being strong and independent. Some policies discussed above are relevant to this objective. The main requirement is an organizational pattern which enables the small, dispersed units to retain individuality and yet obtain strength and advantages of large-scale operation. Co-operatives can meet the requirement. To achieve full results they must build up an integrated co-ordinated structure. Credit, sale and supply, and processing are all vital activities that can be co-operatively organized for the small farmer and their meaningful co-ordination can make the whole structure and community powerful. Such a structure could serve many purposes. It could be the channel for a two-way communication with state agencies; it could act as pioneer in technological innovation and rural industrialization; it could, in many ways, help to distribute rural incomes equitably and to redress the chronic urban-rural imbalance. However, its establishment and functioning in this manner are dependent on a number of preconditions, social and political.

Socio-political operations remain an uncharted, uncertain field. Technical progress appears compatible with varied socio-political structures and

ideologies and no determinate path can be postulated for the future, in any country. There is also the additional possibility of an external power imposing a regime or ideology to 'free' you. In the circumstances, all that can be done is to point to problems and possibilities illustratively as above and to conclude that the future of farm people in any country will depend to a large extent on their own internal and organizational strength.

Finally, we turn to international aid. This has to be looked at in proper perspective. The achievements of modern Western man have been based on subjugation and exploitation of the whole world. He has, in the process, exterminated some races, imposed political rule on others, and arrested the development of most economies to serve his own ends. The unbalanced situation in under-developed countries and the dilemmas they face today are chiefly the creation of Western men. Basic subservience of their economies to the West continued till the Second World War. The changed situation since, exhibited in the concern with planned development of these countries and aid to them, was in large part due to the need for containing communism. International Commodity Agreements and other efforts at stabilizing terms of trade of under-developed countries have so far failed. Aid has flowed chiefly from government to government and international organizations are dominated by power blocs. Recently it has been made clear that the era of aid without strings has ended! Therefore, while expressing sincere thanks for the aid received during recent years, the under-developed countries should realize that the size and shape of future aid will depend mostly on political developments. Therefore, developing countries will be ill advised to treat aid as an essential resource in their plans of development. They will have to adopt an 'opportunist' attitude towards it.

S. R. SEN, *India*

While Bawden and also possibly Bićanić may sound too optimistic, both Borrie and Kristensen appear to be too pessimistic. The former are forward-looking in as much as they indicate the knowledge and potentialities which lie ready to be exploited in future. The latter are rather constrained as they mainly project past practices into the future. Actual developments in the future would seem to lie somewhere in the middle.

The type of over-all projection of recent trends into the future, which both Borrie and Kristensen have attempted, tends to submerge rather than to reveal the more dynamic elements in the situation. A study in comparison and contrast of the experiences of different regions would have been much more meaningful than the rather mechanical over-all projections which they have presented.

In a world of rapidly changing technology and conscious efforts made by governments to change trends, a mere statistical extrapolation of past trends is not the best way of making realistic and useful prognostications. At a time when the I.U.C.D. and the pill, the high-yielding varieties of foodgrains, and the new yield-raising and pest-controlling chemicals, are about to take us on to a new and higher plane, as it were, can simple

projections of past trends on the old plane be very meaningful except as indicating the lower limit? We need not accept straightaway all the possibilities which Bawden has indicated, but must we reject even those which have already begun to be adopted? A range rather than a single projection seems to be called for in such cases.

In the projections of both Borrie and Kristensen, the Indo-Pakistan sub-continent has a crucial place. Adding up the data for this area with those of other under-developed countries, where conditions are quite different, certainly does not help understanding. Even within a country of the size of India, if the recent experiences of fairly large areas like Punjab and Madras in regard to relative population and production trends are studied in some detail (especially in contrast with areas like Lahul and Terai mentioned by me earlier) and the possibilities of their repetition in other areas are explored, the future may look quite different from the projection of Kristensen. Even taking India as a whole, let us briefly compare the experience of the period before and after 1951 when development planning first started.

During the fifteen years prior to 1951, population increased at the rate of 1.25 per cent per annum but food production declined by 0.68 per cent per annum—although weather conditions were generally favourable and there was no serious drought. During the fifteen years following 1951, population increased by 2 per cent per annum but food production increased by 2.75 per cent per annum and this in spite of the fact that weather conditions in the sixties were rather bad and the last two years have brought the worst droughts in forty years. Further, real technological breakthroughs like high-yielding varieties of grains and large-scale use of fertilizers and pesticides have come only very recently and their full potential has yet to be exploited.

Again, Kristensen's projections are based on the assumption of a certain kind of weather. The trend would be quite different if that kind of weather does not obtain. The question is 'should we postulate for the seventies, and after, the kind of weather we had in the sixties or what we had in the fifties?' Further, fluctuations from the trend are perhaps even more important than the trend itself. If the fluctuations are of the order which were experienced in the thirties, forties, and fifties, the situation will be of one kind; if the fluctuations are of the order which were experienced in the first two decades of the century and again in the sixties, the situation will be of quite a different kind. We should not lose sight either of the fact that if the recent drought has resulted in large food imports, it has also led to the creation of very large production facilities. Should we take into account in our projections only the former and ignore the latter? How can one include in Kristensen's projections the fact that in one year, 1966-7, more tube wells and irrigation pumps were installed in Bihar and Uttar Pradesh than in the previous fifteen years taken together? Further, where is there provision in these projections for the kind of 'adjusters' which Dr. Paarlberg speaks of in his paper? It seems to me that the technological innovations which Bawden highlights and the political compulsions which

Bićanić hints at are likely to influence future trends of population and production. Also the fluctuations around the trend are much more significant than Borrie and Kristensen allow for.

REPORT OF QUARTER CONFERENCE 3

THE conventional dichotomy of 'developed' and 'less-developed' countries was seen as too sharp. An understanding of the questions dealt with in the four major conference papers necessitated a far more fundamental examination of the process of economic development than has been made to date. A society's philosophical base, its ability to approach development in an objective, systematic, and scientific manner, and the capability of its institutional structure to support changes required for sustained economic development, are all relevant. The conclusion from this was that the fundamental issues were those involving means of bringing about change in ideas, concepts, philosophies, and institutions.

Significant analytical limitations of such measures as the land/man ratio and the problems which arise in its use and interpretation received some attention, so too, did the inadequacy of problem formulations and analyses involving only the naïve relationship between numbers of people and facilities of food available. The importance was stressed of formulating and analysing the agricultural development facilities in the relevant context of the contributions of agricultural to general economic growth and development, increased *per capita* incomes and rising standards of living.

The thesis that the developing nations might be well advised to follow the industrialization route to development and rely upon industrial export earnings as a means of meeting food requirements through imports from developed nations was viewed sceptically by some speakers. The validity of the conclusions rested on the validity of (a) the projections of the demand for food in the future and (b) the rate of growth in agricultural output. It was questioned whether the basic work had delved into recent changes in agricultural output potential in countries such as Pakistan and India. An agricultural growth-rate in recent years of about 3.5 per cent per annum was quoted for Pakistan with expectations of a sustained growth-rate of some 5 per cent per annum in the future. These relatively high rates of growth were attributed to (a) sharply increased use of high pay-off technology, (b) agricultural institutional reforms, and (c) enlightened agricultural price and other policies directed towards improving the incentives to increase output.

In response to questions about the availability of new land for agricultural use, it was suggested that the Amazon Basin was one area that had such potential. In a contrary view the necessity was stressed of carefully appraising the economic potential of such areas relative to alternatives. It was most likely that the use of the Amazon Basin would be postponed until other areas had been used. For example, in the central and southern regions of Brazil there was a vast extent of land which was likely to be used prior to the Amazon region.

In addition to the points indicated above, numerous other issues were raised and discussed. These included the need for natural scientists and economists to co-operate in obtaining data necessary for meaningful economic analysis, the relationship between increases in agricultural output and factors such as the terms of trade, production potential of resources currently in use, motivations of and incentives to producers, and production variability at higher levels of productivity.

Among those participating in the discussion in addition to the opening speakers included: J. Klatzmann *France*, A. B. Lewis *U.S.A.*, Shison C. Lee *Taiwan*, Arb Nakajud *Thailand*, Geoffrey D. Oliver *Australia*, Chami Joseph *Lebanon*, Imre Molnar *Australia*, Antonio R. Teixeira Filho *Brazil*, Michael Petit *France*, John W. S. Mackenzie *Australia*, Emil W. Owens *U.S.A.*, Richard Pringle *Vietnam*, Clarence E. Pike *U.S.A.*, F. Popping *O.E.C.D.*, N.M. Mubyarto *Indonesia*, Kwame Opoku-Owusu *Ghana*, C. Lister, *Iran*, M. Shafi Niaz *Pakistan*, Y. Lowe *Israel*, H. B. Low *New Zealand*, A. G. Lloyd *Australia*, R. E. Cooke-Yarborough *Australia*.