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*Accomplishments and Opportunities for Agricultural Economists on the Theoretical Front\**

I was asked to summarize, briefly, the history of the work of agricultural economists around the world working at the disciplinary level, and to look forward in more detail at the opportunities, problems and challenges. This task may seem more suited to several years' work from an entire research institute than to one agricultural economist given only a few weeks in the middle of a busy university term. Indeed, even without the constraint of time and space, it is arguable that no one agricultural economist could be expected to have a sufficiently comprehensive, yet nevertheless detailed, knowledge of our discipline to be able to do justice to all theoretical accomplishments and opportunities. For this reason, I have chosen to devote much of my paper to an attempt at providing criteria which might enable us to judge what are the theoretical accomplishments of agricultural economists and where the main challenges and opportunities lie, rather than to allow my own views on this subject, obviously coloured by personal experience and interests, to dominate. The paper, therefore, proceeds first in the form of suggested answers to four questions: what part of the work of agricultural economists can be described as agricultural economic theory? What is the role of theory in agricultural economics? How can we judge whether or not a theory is a good one? What constitutes an "advance" in economic theory? This is followed by a suggested framework for categorizing theoretical contributions. Finally, I give a personal impression of accomplishments and opportunities.

Throughout I use the term "agricultural economic theory" to refer to the contributions of agricultural economists working at the disciplinary level. Whether or not there is such a thing as *agricultural* economic theory, rather than merely the application of economic theory to agriculture, is something of a pedantic point which I leave aside.

<sup>1</sup> I would like to thank Professor Ashton of Newcastle University, Professor Marsh of Aberdeen University and Professors McInerney and Tuck of Reading University for their helpful comments on an earlier draft.

## WHAT IS AGRICULTURAL ECONOMIC THEORY?

The word “theory” has a well defined and well accepted meaning. Nonetheless, when attempting to categorize a piece of research in agricultural economics, the distinctions can become blurred.

Perhaps the most straightforward definition is to say that a theory attempts to explain processes, or relationships between variables. A more precise definition<sup>1</sup> would be that a theory consists of:

- (a) an assertion that a given set of phenomena exhibit some element of pattern, and
- (b) a specification of that pattern sufficiently full to enable certain elements to be filled in if enough is known about the rest; this embraces both prediction and questions involving unobserved or unobservable simultaneous events.

To give one example, the theory of the supply of a farm product attempts to explain the process by which the quantity supplied of the product per time period increases (if it does) when the price of an input falls. The explanation might be quite complex, involving typically an assumption about behaviour – an objective function – and interrelationships between many variables. Because the relationships involved are essentially quantitative ones, agricultural economists have increasingly found it convenient to present theory as formal models described with the aid of mathematical equations, in symbolic or diagrammatic form.

The above paragraph implies that quite a lot of research by agricultural economists can be said to include a theoretical component. Can we identify any significant areas of research which do not involve theory? In fact it is arguable that virtually all of the work of agricultural economists involves theory to a greater or lesser extent. But clearly, some areas are more directly founded in economic theory than others and, for the purposes of this paper, I suggest three areas which can be excluded.

First, there is the work which merely attempts to assemble data of relevance to agricultural economics: “How many farms are located in a particular area?” “What did they produce?” “How have product prices changed over time?” This is the descriptive part of agricultural economics – the work which aims to paint a picture of the economics of agriculture or food in a particular place or time – the picture that the theory attempts to explain. The main function of this kind of work is to assemble relevant factual material, and theory is not about facts but about relationships.

Even here there are, of course, exceptions. For example, there is at present in the UK a lively debate over the “cost” of membership of the European Community. (This cost is mainly attributable to the Common Agricultural Policy.) But the debate is essentially a theoretical one, with estimates of this cost (e.g. Bacon and Godley, 1979) challenged, not on grounds of accuracy, but on the basis of disagreement over what it is that one should be attempting to measure (Ashton et al, 1979).

Second, I think we can exclude much econometric work. On occasions, the econometrician takes a theory off the shelf, as it were, and then simply

attempts to identify the specific form that the relationships, incorporated in that theory, take in the particular example to which his data relates. Thus the theory predicts that the quantity supplied will increase if the price of an input falls; the econometrician predicts by how much in the case of, say, corn in the USA. However, much of the work of econometricians does of course contribute to the advance of agricultural economic theory, for a number of econometric exercises may provide information which indicates the relative importance of the different variables within the theory and may indicate the validity of alternative theories. Indeed, one role of econometrics, as a discipline, is to test alternative economic theories.

The third area which I think can be excluded is the development of techniques to aid private decision-makers, or public authorities, to take decisions which fulfil their objectives. The main work of agricultural economists in this area has been in the field of farm management, but increasingly this work has also covered food distribution and marketing – “marketing management” – as well as the application of techniques to deal with things like discounting and risk in the analysis of public projects and policies. Again, of course, this kind of work may well make a contribution to agricultural economic theory (as well as sometimes being founded in mathematical or statistical theory). The farm management expert may be able to throw light on producer objectives and economic relationships within the farm. He may need to develop the theory of the farm firm himself to help him in his management work, and for this reason the subjects of farm management and farm production economics have tended to advance hand in hand, with many distinguished agricultural economists contributing to both subjects.

Finally, I should emphasize that, for the purposes of this paper, I am restricting theory to “economic theory”. I have already mentioned “mathematical theory”, and there is much other theoretical research which forms part of what we sometimes term “agricultural economics and related disciplines” but which is not rooted in economic theory. Examples of this are the work of rural sociologists and the application of the behavioural sciences in agricultural marketing.

## WHAT IS THE ROLE OF THEORY IN AGRICULTURAL ECONOMICS?

The *raison d'être* of the discipline of agricultural economics is that there are important, and distinct, problems to be found in the agricultural and food sectors of an economy. The role of theory is to aid in the solution of these problems.

Whenever it is possible to argue that the actual state of affairs differs from the desired state of affairs, a problem can be said to exist. In the context of agricultural economics, economic problems vary from those associated with individual farm producers and food consumers, to those

involving the extent to which events in agriculture are consistent with national objectives, through to problems at a global level (such as “the world food problem”). Since theory attempts to identify relationships between variables in an economic system, theoretical knowledge should provide increased ability to control events within the system; by the judicious manipulation of certain variables, the actual state of affairs can be moved in the direction of the desired state of affairs.<sup>2</sup>

### WHEN IS A THEORY A GOOD ONE?

Ideally, there is only one way in which we can judge whether or not a theory is a successful one, and that is to test it. Unfortunately, in the case of economic theory, this is often simply not possible because of the lack of scope for experimental verification. Hypotheses, particularly on large scale or long run issues, or where the predicted outcome is not directly measurable (as with individual and collective utility), have to become established doctrine by argument. Because of this there will always, presumably, be more scope for error, uncertainty and disagreement in the case of economic theory than with the physical sciences.

In judging the merits of a theory in agricultural economics we should ask first whether it is relevant to important issues – important in the sense that they involve what are thought to be significant problems. Second, are the relationships postulated within the theory, as well as its predictions, credible in the light of what has been observed to occur? In other words, it is possible to test the accuracy of some theories, or aspects of theories, by investigating how reliable they are at predicting events which are observed to occur.

To illustrate this, let me cite two theories, one which comes out well on this basis and one which does not. The first is the so-called cobweb theory (or theorem). This is a very simple theory which can be expressed as three equations: quantity demanded of a product in time period  $n$  is a function of price in time period  $n$ ; quantity supplied of the product in time period  $n$  is a function of price in time period  $n-1$ ; and quantity supplied in time period  $n$  equals quantity demanded in time period  $n$ .

The theory is not much liked by many agricultural economists, perhaps because it seems to offer an over-simplified explanation of fluctuating prices. It is even not much liked by many students who find it difficult to accept that producers should continue to fail to forecast prices accurately in spite of the evidence of cycles. Yet the theory works. Agricultural economists continue to observe regular cyclical price movements for many agricultural commodities and the cobweb theory, particularly when refined to include a decision time lag, as well as one due to the biological production process, and to incorporate a supply response which is elastic only over an intermediate price range, provides a good explanation of these cycles.

The second theory is that of the perverse supply curve, which is once

again much in vogue in Western Europe, where we are told continually that it is no use cutting prices to reduce surplus production, since farmers will only respond by increasing output. Admittedly this is not a view held by many theoretical agricultural economists, though students of agricultural economics, when confronted with the theory, find it intuitively very reasonable. Curiously, many who take the view that a reduction in product price will lead to an increase in output do not regard this so much as an alternative theory, but more as good sound common sense which just goes to show that theoretical economists are not well informed about what goes on in the “real world”.

The theory itself is a perfectly respectable one. It is based on the view that for the small peasant producer, and even the larger family farm, the appropriate behavioural hypothesis will be the objective of maximizing the collective utility of the farm family, which will be derived from a combination of income from farming and leisure. Inasmuch as there is a trade-off between level of farm output and leisure, and particularly where there are few purchased inputs, it follows that a fall in product price could (though not necessarily will) lead to an increase in output. In its simplest form, the theory incorporates a producer objective of a single target income, and in these circumstances it follows that a reduction in product price will lead to an increase in output.

However, to the best of my knowledge there is very little evidence to suggest that supply is related negatively to product price – at the sector level, anyway. On the other hand there is a mass of evidence throughout the world to suggest that if prices go up output goes up, and if prices go down output goes down, or at least is less than it would otherwise have been.

It is perhaps worth emphasizing that the fact that two agricultural economists hold very different views concerning future patterns of prices, production, land use or whatever, does not necessarily imply that they accept different theories. It is true that different theories – in the sense of different views of the functional relationships involved or the nature of the objective function (as in the case of the perverse supply curve) – may well lead to different predictions about the future. But different predictions will also be the outcome if agricultural economists hold different views on likely future changes in exogenously determined variables.

A good example of this is provided by the conflicting views concerning food surplus and food shortage, where many of the agricultural economists involved perhaps believe that they take a different theoretical approach from agricultural economists who have come to different conclusions. However, these views do not necessarily involve a theoretical inconsistency. Both groups of agricultural economists would accept that the longer term evolution of food prices is a consequence of changing conditions of supply and demand; both groups would also probably accept that the main factors affecting the longer term development of demand for food products are real incomes and population growth and, affecting the growth in supply, technological and institutional progress

and resource accumulation. If agricultural economists take different views concerning the extent to which quantity supplied or demanded is likely to respond to changes in these variables – for example, different views on the magnitude of the relevant income elasticities – then different predictions on the likely future course of world food prices will result. But equally, if they hold similar views concerning the functional relationships involved, but different views concerning the likely future changes in the values of the variable themselves, they will predict different outcomes. An assumption of rising real incomes, low population growth, and technological progress in agriculture, will lead to one set of conclusions; assumptions of rapid population growth, low productivity improvement and capital accumulation insufficient to offset diminishing returns to land, will lead to another.

### WHAT CONSTITUTES AN ADVANCE IN AGRICULTURAL ECONOMIC THEORY?

Existing theory may be erroneous or incomplete. In addition, changes in the power of the means of observation and intervention may make theoretical development relevant which was not previously.

Another reason for the advance of agricultural economic theory is that existing theory may no longer be relevant because the functional relationships have themselves changed over time. For example, in a particular country, agricultural production, once dominated by small peasant producers, may have gradually come under the control of modern commercial farming. A modified theory of supply and resource use may now be required. More dramatically, a major land reform might replace an agricultural sector dominated by large estates and employed labour, by one with a structure involving thousands, or millions, of small independent land owner-producers. Clearly, a new approach in the theory of the behaviour of the agricultural sector will be required, not because the old approach was necessarily incorrect, but because the production relationships themselves have changed.

An aspect of this is emphasized by Gordon (1976) in his presidential address to the American Economic Association:

I turn now . . . from rigour and relevance to the fact that we live in a world that is continually changing . . . to what extent does the changing institutional environment affect the relevance of the analytical tools that we use and the assumptions that we make about the determinants of individual and group behaviour?

Another possible reason for the advance of agricultural economic theory is that an approach which provides a sound basis for analysis in one part of the world may not be applicable elsewhere. In this context, many agricultural economists have been concerned that theories developed in the economically advanced countries might provide incorrect, or at least

incomplete, explanations of economic events in the developing countries.

The response to these various stimuli may be the development of new theory. On the other hand it may take the form of a process of refinement; not developing a new explanation, but improving and refining existing theories. Either kind of contribution could reasonably be called an advance in agricultural economic theory. To use an analogy from land economics, the theoretical front possesses an intensive as well as an extensive margin. One example of advance on the intensive margin is the contribution of powerful mathematical notations. An agricultural and food production and distribution system can involve countless inter-related variables. Arguably, one sign of a good economist is the ability to investigate the complex set of probable reactions to some given economic change, rather than to see merely a set of two-dimensional relationships, all aided by a *ceteris paribus* assumption. Sometimes the interrelationships involved in a theory may be so complex that the theory can only properly be understood if it is set down as a formal model. Thus the formal mathematical model may help the original researcher to clarify his ideas and, more particularly, to communicate them to his fellow agricultural economists. However, a word of caution is appropriate here. There may be occasions when the agile mind can see important relationships beyond the confines of a formal model.

The use of mathematical techniques in agricultural economics may also have extended the theoretical margin. I am thinking of examples such as the impact on the theory of the farm firm of linear and dynamic programming.

### CATEGORIZING CONTRIBUTIONS TO AGRICULTURAL ECONOMIC THEORY

There are many possible ways of categorizing agricultural economic theory, none wholly satisfactory. Theory relates to the working of a system and any subdivision of the system will be to some extent arbitrary and for many purposes not essential. Probably the most helpful method of subdivision for the purposes of this paper<sup>3</sup> is to take that part of an economic system which is normally regarded as coming within the agricultural economist's sphere of interest, as illustrated in Figure 1, and then to distinguish within this a set of major subsectors. In this way, Table 1 suggests five main areas in which theoretical agricultural economists work, namely (1) rural resources; (2) farm production; (3) agricultural marketing and distribution; (4) food consumption; (5) international trade in agricultural products. The table gives some examples of theoretical work under the various categories. They are only examples – the table is not intended to be exhaustive, though most contributors to agricultural economic theory which come to mind do seem to fit reasonably well into this framework.

The main drawback of this kind of distinction is, of course, that many



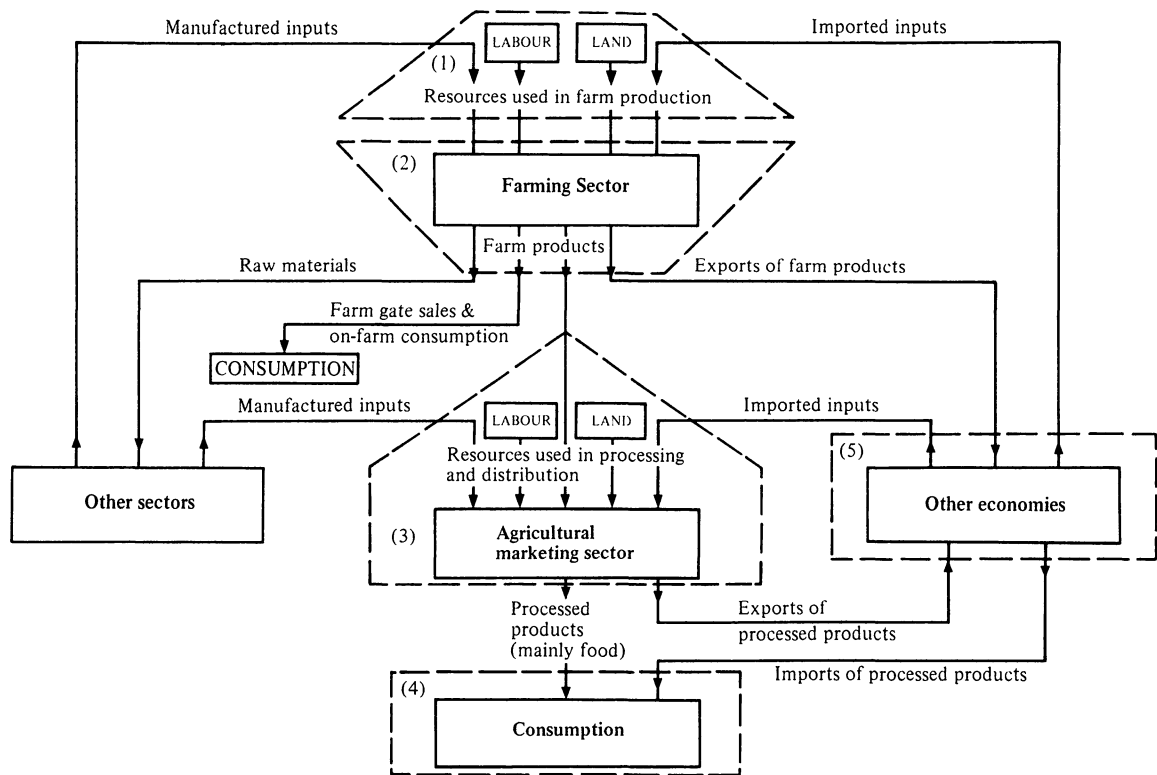


FIG. 1 Source: Adapted from Ritson (1977)

TABLE 1.

	Rural Resources (1)	Farm Production (2)	Agricultural Marketing and Food Manufacturing and Distribution (3)	Food Consumption (4)	International Trade in Agricultural Products (5)
Explanatory Theory	Theory of Resource Allocation. Determination of prices in factory markets	Theory of the behaviour of farm firms	Impact of market structure on marketing margins	Demand Theory	Explaining movements in world food prices
Prescriptive Theory	Land Tenure Policies. Optimum allocation of national resources	Measuring producer satisfaction. Impact on producer welfare of farm support policies	Assessing the efficiency of market support and stabilisation policies	Measuring consumer satisfaction	Impact of trade policies on producer and consumer welfare

agricultural economists are ultimately interested in a theory which encompasses the operation of the entire agricultural and food production system, and indeed its interaction with the rest of economic activity, for example, the impact of developments in consumer demand for food products on international trade in farm products, or implications of a changing agricultural trade balance for the performance of the economy as a whole. So in addition to the kind of contributions listed in the table, one would also expect theoretical contributions directed specifically towards the interaction between the components.

One way in which this is done is by lifting a predictive relationships from one area and inserting it in another. Thus the theory of the farm firm is concerned with the way farms will react, in terms of what they produce and the inputs they use, to changing economic circumstances, and this allows us to derive a supply response to changes in product prices and a demand response to input price changes. Both these relationships are founded in the theory of the farm firm, but one relationship is also central to the behaviour of agricultural product markets and the other to the theory of agricultural resource use.

The table makes a second distinction, between what I have called "explanatory" (or predictive) theory and "prescriptive" (or problem-solving) theory. I am not suggesting that there are two *kinds* of economic theory. But I think it is possible in many cases to identify alternative emphases in theoretical work. On the one hand there are contributions directed towards explanations of some aspect of how the agricultural and food system operates and which can, if successful, be used to predict the consequences of some economic change, but which do not, in general, attempt to pass comment on the desirability or otherwise of the predicted developments. On the other hand, there are contributions directed specifically towards problem solving, where the main interest is the relationship between any particular set of circumstances within the agricultural

and food system and individual and collective welfare.<sup>4</sup>

Of course not all contributions will fall neatly into one or other of these approaches; often the approaches will have to go together. For example, the economist who wishes to investigate the social consequences of existing land tenure arrangements may have to develop an explanatory theory before he can do so; the economist who wishes to assess the merits of alternative agricultural trade policies may need to develop a model of the interaction between national markets in farm products. A good example of the latter is Josling's article "Government Price Policies and the Structure of International Trade" (1978). The article is directed towards "improving" the performance of international agricultural markets and world food security. But first the article develops a predictive model of the structure of international agricultural trade based on the assumption that Governments have a target level for domestic farm product prices, and that trade is the consequence of the reaction of domestic producers and consumers to that price target, irrespective of developments on world markets.

This distinction will often therefore do no more than indicate the "flavour" of a piece of research rather than provide a categorical classification. Nevertheless I believe it to be a helpful one because it emphasizes that there is a normative element in virtually all agricultural economic theory. Even a simple "pure" explanatory theory of, say, the behaviour of an agricultural product market will probably have been developed because of a perceived problem associated with the behaviour of the market and implicit in the problem will be assumptions about certain individual or collective objectives.

## ACCOMPLISHMENTS AND OPPORTUNITIES

A framework for categorizing theoretical contributions, together with criteria for judging their effectiveness, provides in principle the opportunity for a review of the accomplishments of agricultural economists at the theoretical level. However, no one agricultural economist is likely to be sufficiently informed concerning recent theoretical developments throughout the discipline to be able to provide an authoritative review of this kind. I have already made some comments which indicate my "view" on accomplishments. In summary, and very tentatively, I suggest that, of the five areas covered in the columns in Table 1, the theory of the farm firm is the most well developed within the discipline. The food consumer also seems to be a well researched and generally predictable animal, and another success of agricultural economic analysis is surely the accumulation of fairly reliable elasticity estimates, particularly on the demand side. Second, I would suggest that, in general, explanatory theory is more successful than prescriptive theory. But this is not to suggest that agricultural economists taking the prescriptive approach have accomplished little; rather it indicates the greater complexity of the issues raised by

welfare theory and (to quote Gordon again) human welfare is a "concept that will not go away no matter how uncomfortable it makes the economic theorist". In this context, I think the development of formal analysis of the welfare effects of agricultural policies must be a strong candidate for the most important advance in agricultural economic theory over the last decade.

Third, at both levels, my impression is that it is in the area of time related problems that many of the current opportunities for useful work lie. This applies particularly to inter-temporal questions of resource allocation. Another example is the problems which occur when attempting to assess the implications of food price instability for consumers.

Looking to the future, I suggest two areas where a "challenge" can be said to face agricultural economists working at the disciplinary level. The first is the need to present agricultural economic theory in such a way that its practical significance is comprehensible and convincing to decision-makers, particularly in the field of public policy. I can illustrate this by the use of an example which, as it happens, it also consistent with my remarks that the greater theoretical problems concern both time related questions and prescriptive theory.

The author of a (justly) respected book on the *Economic Analysis of Agricultural Projects* (Gittinger, 1972), while discussing the choice of an appropriate discount rate, comments, "A third rate sometimes suggested is the social rate of return, a rate, which it is suggested, more adequately reflects the time preference of society as a whole than does the opportunity cost of capital. Although interesting in theory, it is too difficult to identify in practice to be commonly used for agricultural project analysis". As a consequence, "In practice, the rate chosen is simply rule of thumb: twelve per cent seems to be the popular choice and almost all countries seem to think it lies somewhere between eight per cent and fifteen per cent".

The author of this book is, in effect, reporting a failure of theoretical economics. The theoretical analysis surrounding the choice of a social discount rate is of little value if the arguments involved are so complex that the issue is ignored by those who take public investment decisions. Yet the issue is immensely important, affecting decisions over resource depletion and land use – indeed the whole of the future world economic environment. Unless a relatively low discount rate is used, economic analysis can rarely justify a public decision which involves a present cost, but a benefit far into the future. For example, "the seal of official approval for the use of ten per cent as a discount rate in land use economics, set by the recent Treasury cost-benefit of forestry, would seem, temporarily at least, to end the British forester's hope of an economic rationale for upland afforestation. No matter how many social benefits were dragged into the analysis, the study team found it impossible to achieve a positive net present worth for new planting". (Price, 1973)<sup>5</sup>

The second area which seems to me to provide a challenge to theoretic-

cal agricultural economists concerns what I will call, heroically, "World Welfare". Agricultural economists have sometimes been nervous about becoming involved in the kind of theoretical questions which I have termed in this paper "prescriptive", believing that such an approach required personal value judgements. But gradually it has been realized that, where it is possible to identify government objectives, in particular reflecting income distribution and collective goods, then it is quite possible to tackle these questions by positive method. This has paved the way for the work of agricultural economists in such areas as agricultural policy, cost-benefit analysis, land use studies and resource economics. Most of this work has been at a national level, assessing alternative policies relative to national objectives.

In the international arena, most work has been of the explanatory kind; prescriptive theory has still been seen in terms of national interest, for example the mutual advantages associated with trade liberalization.

The issues surrounding the "new international economic order" have perhaps made many question the adequacy, on its own, of traditional theoretical approaches to agricultural production, consumption and trade at the world level. There may be an analogy here with the difficulty that some economists have experienced in tackling welfare theory at a national level. In a sense, just as a nation is composed of many individuals attempting to fulfil personal objectives, so the world is composed of nations attempting to fulfil national objectives. Correspondingly, just as predictive theory at the national level is based on the assumption that individuals seek the maximum attainment of personal objectives, so trade theory assumes a world in which sovereign states seek maximum attainment of national objectives. This raises the question of whether there is an analogous step, at the world level, to that taken by agricultural economists who have undertaken policy studies at the national level and found it necessary to develop theory beyond traditional ideas of economic efficiency and to incorporate distributional and environmental objectives. A theoretical approach to resource allocation and product distribution, which restricts itself to the Paretian principle, must be as inadequate at the world level as it is at the national level. But the task of incorporating realistic distributional objectives into a positive analysis of international agricultural economic policies is clearly a formidable one.

One of the more interesting developments in agricultural economics in recent years has been that, whereas previously a significant proportion of the profession seemed to split into economists interested in agricultural problems in economically advanced countries and those concerned with agriculture in low income countries, increasingly both are concerned with world problems. Some work in the field of trade policy does now attempt to work within the confines of what one might call "world" objectives, such as world food security and price stability. Perhaps in the 1980s we may see a new fusion in agricultural economic theory, concerned with problems common to many countries, and more particularly, achieving patterns of production and resource use directed towards the interests of the world viewed as a whole.

## NOTES

<sup>1</sup> I am here quoting R.H. Tuck.

<sup>2</sup> This way of presenting the problem-solving role of theory in agricultural economics is attributable to John McNerney.

<sup>3</sup> An alternative is suggested by McNerney (1976): "If economics is to be functional as an applied discipline . . . it needs to identify problem situations and group them into types which share a common thread in economic terms – whether that thread is a common objective to be satisfied, common constraints on choice, or a requirement for a common analytical approach".

<sup>4</sup> This distinction is somewhat analogous to that which identifies the subject matter of Volume 3 of a *Survey of Agricultural Economic Literature* (1977) – "Economics of Welfare, Development and Natural Resources". The five columns in Table 1 also bear some resemblance to the way the subject matter of Volume One of the *Survey* (Traditional Fields of Agricultural Economics) is divided.

<sup>5</sup> In fact, upland afforestation has gone ahead, with or without the approval of economic analysis (and the UK Treasury has also recently "come down" from ten per cent). But how many longer term investment proposals fail because the plan is apparently "uneconomic"? Is the well known difficulty experienced by aid-giving organizations when searching for "suitable" projects partly the consequence of discounting the future too heavily?

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## DISCUSSION OPENING – RICHARD A. KING

Professor Ritson has offered us a lucid and comprehensive view of the role of economic theory in the field of agricultural economics. He emphasizes the need to present theory to decision-makers in a comprehensive and convincing fashion. He closes with a call for a more complete world view within which agrarian development strategies are considered. His observations bring to mind a number of features of economic theory that are, in some respects, unique to the work of agricultural economists.

With respect to possible refinements of economic theory, it is common for agricultural economists to work in a world of inelastic market demand. Most economics texts fail to provide students with an understanding of the relationship between inelastic demand and negative marginal revenue. Economic models that are built around positive marginal revenue functions cannot possibly convey the real world setting within which agricultural policy choices are made.

In Figure 1 Professor Ritson provides a convincing picture of the interdependencies that characterize the food and fibre sectors of an economy. These interdependencies are often missing from the theoretical constructs found in many theory books. To make matters worse, one finds many partial models that purport to describe the real world in sufficient detail to allow policy prescriptions when in fact far too much has been "held constant".

The spatial arrangement of resources and economic activity play a central role in any analysis of rural change. Far too many economics students complete their formal graduate study without ever hearing the name of von Thünen, in spite of the fact that his work has been elaborated upon for over a century and a half.

The level of aggregation found in many theoretical treatments is inappropriate for sound evaluation of policy alternatives. Only when the impact upon the various participant groups can be identified is it reasonable to suppose that decision makers will find the results of economic analysis to be convincing.

Current or proposed policies cannot be evaluated in a vacuum. Agricultural economists are sensitive to the need for weighing alternative courses of action. Theoretical arguments that serve to discredit a particular choice without specifying one or more options that are clearly superior are likely to carry little weight. Economic growth literature, in particular, is full of examples where choices are so obscure as to be worthless for decision-making purposes.

Near optimum solutions get little attention in many theoretical models. Agricultural economists have long been aware of the value of looking at the benefits and costs of close alternatives, whether at farm, marketing firm or system levels.

Finally, agricultural economists are confronted with the need for theoretical models that go beyond profit maximization or cost minimization. As has been emphasized at this conference by several speakers, efficiency, equity and security dimensions of private and public choice call for more complete theoretical models.

## GENERAL DISCUSSION – RAPPORTEUR: RICHARD F. BATES

In the general discussion the view was expressed that the theory of the farm-household relationship and consumer theory, especially with regard to the nutrition and income-expenditure relationship, were important

fields of investigation in LDCs and were not covered in the paper.

It was also pointed out that there are many different theories in economics. Economic theory cannot be assumed to be a monolith. The different theories do not necessarily mesh together to make a unit.

In reply, Professor Ritson said that with regard to the statement that there were many independent theories, this was in fact correct and that the statement merely elaborated and complemented that which he had already quoted in his paper.

With regard to "World Welfare" he was of the belief that agricultural economists could make a real contribution towards assisting decision and policy makers in evaluating the impact of measures on different groups within economies.

Participants in the discussion included Chandrahas H. Shah, Clark Edwards, and Indra Jit Singh.