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A SURVEY OF AGRICULTURAL ECONOMICS LITERATURE

VOLUME 4

Agriculture in Economic Development, 1940s to 1990s

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PART FOUR

Philosophic Foundations of Agricultural Economic Thought from World War II to the Mid-1970s

Philosophic Foundations of Agricultural Economic Thought from World War II to the Mid-1970s

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Chapter I. Introduction

Philosophic considerations helped to shape the history and literature of agricultural economics since World War II. The philosophic orientation of agricultural economists determined the kind of literature they produced, and in turn that work and literature determined their philosophic orientations. Agricultural economics literature is better understood when one is sensitive to its philosophic orientations.

Scholars writing on philosophy and methodology sometimes apologize for discussing a boring, semantic, unproductive subject [Harrod, 1938]. No such apology is made here. I do not find it boring or unproductive to understand the philosophic foundations that guide our work and literature, and I do find it important to understand how those foundations are, themselves, changed by our work.

1. Structure of This Review

This review of philosophy in agricultural economics since World War II will be carried out in a farm management tradition, incongruous as that may seem.

*The author would like readers to know that this chapter was written in the late 1970s and therefore does not include current research nor does it reflect his most current points of view.

First we will define terms and basic concepts. Then we will take a *beginning inventory* as of the end of World War II. Following that, what happened between World War II and 1976 will be examined. The beginning inventory, plus *the analysis of what went on in this highly productive, controversial, and dynamic period*, will provide the basis for an *ending inventory* that will indicate the present condition and changes taking place in the way agricultural economists work with philosophy.

2. Coverage

The geographic area of analysis will be primarily the area served by the journal of the American Agricultural Economics Association. The *American Journal of Agricultural Economics* (AJAE) has worldwide significance and serves areas also served by the English, Canadian, and Australian journals. World War II seriously disrupted agricultural economics in Germany, Japan, France, and Italy. Professor Nou [1967] has written an excellent summary of European agricultural economics that covers the immediate prewar period in contrast to the U.S. history by the Taylors [1952] that ends its coverage in 1932. The 50th anniversary issue of the English *Journal of Agricultural Economics* contains useful review articles for our subject [Hunt, 1976; Coats, 1976; Giles, 1976]. Emphasis on literature reported or considered in the *AJAE* with attention to complementary literature permits one to cover many of the important developments in the world's agricultural economics literature from the end of World War II to the early 1970s. Such a procedure will not work in the future as other journals are now functioning well. Fledgling journals in many countries are becoming increasingly important, and the new *European Review of Agricultural Economics* will undoubtedly become highly important in world agricultural economics circles.

It should also be noted that some important writings on methodology and philosophy have not been printed; instead, they have appeared as "phantom" literature in mimeographed form, and unbound, unprinted proceedings of seminars and conferences where intense interactions influenced the philosophies and methodologies of leaders. Examples include the crucial Land o' Lakes and Black Duck farm management workshop proceedings,[1] as well as papers presented at the various regional land-tenure and marketing research committees and at the University of Chicago conference on efficiency.

Work, philosophy, and methodology are interrelated. Our work is guided by our philosophies and their accompanying methodology. And, in turn, successes and failures in our work influence both our selection among philosophies and our own philosophic development. Thus, the other review articles of the AAEA survey of agricultural economic literature are most valuable summaries of the work which has both conditioned and been guided by our philosophic thought.

3. Meanings and Basic Concepts

In reply to the frequent charge that philosophical and methodological discussions "are merely semantics," one must note that communications depend on our understanding of the words we use. If we are going to communicate with each other about the interrelationships between our philosophical thought and our work, we must have a vocabulary with which to discuss such matters. This section provides that vocabulary.

Agricultural economists are concerned with the generation, distribution, and use of knowledge. Central to this concern is epistemology—study of the theory of science and the grounds of knowledge especially with respect to its limits and validity [Runes, ed., 1960]. Concern for truth is important in generating, distributing, and utilizing knowledge [Knight, 1940].

THE POSITIVE, NONNORMATIVE, AND PRESCRIPTIVE

Agricultural economics literature contains at least three kinds of knowledge: nonnormative or positive, normative, and prescriptive knowledge. Machlup's [1969] excellent discussion of the meaning of positivism and normativism in economics literature indicates that we should define these three terms. By *positive (or nonnormative)* knowledge, we mean knowledge about conditions, situations, and things—knowledge that does not have to do with their goodness and badness. The use of the word nonnormative, instead of positive, is preferable in contexts where the word positive could imply an unintended acceptance of positivistic philosophy. The word positivistic is used to denote tendencies toward positivism and the positive. The word normative, on the other hand, is used here to denote the goodness and badness, *per se*, of conditions, situations, and things. The word normativistic is used to denote tendencies toward normativism and the normative. The normative is to be distinguished from the prescriptive in that the prescriptive indicates which action or goal "ought to" be sought or attained. The prescriptive depends on both the positive and the normative in a functional way. The function relating the positive and normative to the prescriptive is a decision-making rule. As contrasted to the normative, the *prescriptive* deals with "rightness and wrongness," not with goodness and badness. Following Lewis [1955] we note that it is not always *right* to do that which is good because it may be possible to do something which is better (or more good). And, the *wrong* is not necessarily associated with the bad because it may be right to do (or try to do) that which is bad if it is the least bad which can be done. When there is no alternative course of action which is good, the decision rule becomes a loss minimization rule that makes it *right* to do *bad* (the least possible bad). Conversely, when maximizing good it is *wrong* to do *good* (less good than one could do).

ANALYTIC AND SYNTHETIC

From an epistemological standpoint, it is also worthwhile to distinguish between *analytic* and *synthetic* [Carnap, 1953; Kemeny, 1959, ch. 2]. Purely analytical statements are "formal statements." They have a logical form but contain no empirical knowledge. Logical statements are a consequence of axioms and grammatical rules which permit one to derive other statements from initial axioms. By contrast, synthetic statements and some applied logical statements [Carnap, 1953] purport to describe the real world. Their empirical content comes from primitive terms which are substituted for formal terms in analytical statements. *Primitive terms* are not defined and are not matters of logic; instead they emerge out of the experience of people [Popper, 1959, p. 83; Rudner, 1966, p. 19]. We know what a primitive term means from experience. Eventually, we are able to use such terms to communicate about similar or mutually shared experiences. Once primitive terms are introduced into analytical systems, the systems are said to become synthetic or to be descriptive of the real world—to have empirical content. In agricultural economics literature, this distinction was discussed well by Halter and Jack [1961] and by Schmitt and Timmermann [1969] in commenting on Castle's [1968] observations on objectivity.

Despite the efforts of econometricians, Mini [1974] is concerned that economists overemphasize the analytical (theoretical) at the expense of the synthetic (empirical). Leontief [1971] gives agricultural economists higher marks in this regard than he gives general economists.

The descriptive or empirical content of a synthetic sentence or concept is no better than the primitive terms on which it is based. Similarly, the logic is no better than the axioms which form the basis for the analytical sentences which are transformed into synthetic sentences [Popper, 1959, pp. 81ff.]. Axioms are taken as given and are "unproven." Primitive terms are experienced but never proven. Thus, synthetic or descriptively empirical sentences are always subject to error [Carnap, 1953, p. 125] and dependent on *subjective interpretations* of sense impressions as those interpretations are conditioned by the current stage of development of science and society.

DISCIPLINARY, SUBJECT-MATTER, AND PROBLEM-SOLVING EFFORTS

In reviewing agricultural economics research literature especially, but also agricultural literature about teaching and extension, it is worthwhile distinguishing among three broad types of efforts. The *first* is purely *disciplinary* having to do with improving and teaching the theories, data, and quantitative techniques of the discipline of economics. Disciplinary knowledge can be classified into two categories: those of known and unknown relevance. Those of known relevance are necessarily related to problem-solving research or to subject-matter research which is, in turn, related to problem-solving research. The *second* kind is *subject-*

matter oriented. Examples of subject-matter research include land tenure, food and nutrition, unemployment, energy, and farm management. Subject-matter research is concerned with a kind of information that is broader than the information organized systematically in an existing discipline. The practical reason for dealing with a subject is its relevance to a set of problems. For example, work is often done on the national accounts of a country or of a subsector. Such knowledge goes beyond economics to deal with political subdivisions, technical aspects of society, and human interests and is useful in solving a wide range of problems. However, such knowledge is typically inadequate for solving any specific problem in the set of problems involved. Typically subjects are multidisciplinary because solving most practical problems requires different types of knowledge. Besides, as pointed out above, if not multidisciplinary, a subject-matter area would be disciplinary. There is some circularity involved in defining a subject and the set of problems for which it is relevant. The kind of information considered in defining a subject is part, at least, of the information required in solving a specific set of problems. On the other hand, the set of problems is that set that requires the specific kind of information considered for the subject definition. Important subjects correspond with important sets of problems. *Problem-solving* research deals with a particular practical problem—one problem—before a specific decision maker or, perhaps, set of decision makers. A practical problem is time, space, and decision maker specific. Practical problems are typically multidisciplinary with the mix of disciplines specific to the problem at hand. The solutions to problems are prescriptions as to what ought to be done to solve them. Positive and normative knowledge contribute to the solution of practical problems but are individually inadequate to solve them.

COHERENCE, CORRESPONDENCE, CLARITY, AND WORKABILITY

In science and in human activity, in general, there are four tests which, if failed, establish the falsity or unacceptability of knowledge [Northrop, 1947; Feigl, 1953]. A concept that has been subjected to and has passed these tests can be referred to as objective. An investigator willing to subject his concepts to such tests and to abide by the results can be said to be objective. The less ambiguous and, hence, more falsifiable our knowledge statements are, the greater "faith" we have in those that survive testing [Popper, 1959, ch. 4]. In any event we do not prove empirical knowledge—we only fail to disprove it, which means that all accepted empirical knowledge is accepted on the basis of some "faith" or risk of being disproven later. (See subsection entitled "The Meaning of Truth in Economics.")

The *first* test is that of *coherence or logical consistency* [Runes, ed. 1960, p. 58]. Analytical knowledge as defined above is expected to be logically coherent. So are synthetic systems which include primitive terms as well as axioms. Logical co-

herence among concepts includes comprehensiveness; i.e., the wider the range of logical consistency of a tested concept with other accepted concepts, the greater its acceptability. Thus, the coherence test is somewhat more than a test for analytical truth. Leibniz and Descartes stressed the coherence test [Mitroff and Turoff, 1973]. Mini [1974] has argued in a recent book that economists overemphasize coherence and that they should place more emphasis on *correspondence*, which is the *second* test of truth [Runes, ed. 1960, p. 68]. Such scientists and philosophers as Bacon and Locke placed primary emphasis on correspondence with experience as a test of truth or falsity [Mitroff and Turoff, 1973]. As pointed out above, empirical knowledge is never proven. It must be stressed that it is not given to mankind to know empirical truth beyond question. About all one, either as citizen or scientist, can do is establish empirical concepts "well enough" for the purposes at hand. Descriptive or empirical concepts are not compared directly with reality to find out if they are true or false. Instead, the tested concept is compared with a new concept (not reality) based on new experiences not used in formulating the tested concept to see if the two correspond [Rudner, 1966]. If there are sufficient "degrees of freedom" in the new experiences (or even in the observations used to construct the original concept) and if the two concepts agree, the tested concept passes the correspondence test. The test is one of correspondence between the tested concept and a new concept and of degrees of freedom, not of correspondence between a concept and reality—our minds can only compare concepts. Some analysts and students of research methods regard a conception that has passed the coherence test as *validated* and one which has passed the correspondence test as *verified*. The *third* test is that of *clarity*. Linguistic analysts and others have pointed out that it is difficult to know if ambiguous statements are false because we do not know precisely what they mean. It is not until statements are clear and unambiguous that one can apply the tests of either correspondence or coherence. Ambiguous statements are less clear and less falsifiable [Popper, 1959] than unambiguous ones because they have more than one possible meaning. A *fourth* criterion used by Dewey [1938, p. 160] in establishing the falsity of statements is the test of workability [Mitroff and Turnoff, 1973, pp. 69ff.; Northrop, 1947, ch. 1]. A precondition for applying such a test is objective, descriptive, normative, or prescriptive knowledge. When either a normative or positive concept is used to solve a problem, the workability test consists of checking to see whether the prescribed solution "works" in the sense of solving the problem. The test of workability is one of the cornerstones of pragmatism and has been stressed by Dewey [1938] and John R. Commons [1934] in institutional economics, and recently by Georgescu-Roegen [1971].

In application, the above four tests for truth and objectivity are social; hence, the pursuit of science is a social activity and the knowledge it produces is a social product. If knowledge must be free of social considerations in order to be objec-

tive, then all knowledge (scientific or otherwise) must be unobjective [Lenzen, 1955; Georgescu-Roegen, 1971]. And as disciplines develop through time as integral parts of society, they and the knowledge they generate are "time" and "society" dependent. For a somewhat different point of view on objectivity, see Breimyer [1967] and Grove [1968].

Chapter II. The Beginning Inventory

Our beginning inventory for the postwar era covers activity *circa* World War II with respect to methods based on three or four broad philosophic approaches. These approaches include Wisconsin pragmatic institutionalism, positivism, and utilitarianism [Salter, 1948]. Positivism, in turn, can be divided in agricultural economics into Cornell empiricism and the more theoretical statistical developments which found pre- and post-World War II expression in the works of Henry Schultz on price analysis at the University of Chicago, Mordecai Ezekiel in the U.S. Department of Agriculture, and George Snedecor at Iowa State College, not to mention members of the Cowles Commission then at the University of Chicago. See Judge *et al.*, eds. [1977] for a review of the statistical literature of this period. Recognizing the desirability of distinguishing between Cornell empiricism and the more theoretical work of statisticians and econometricians, this inventory is divided into four parts: Wisconsin institutionalism, Cornell empiricism, utilitarianism, and theoretical statistics and econometrics.

The order in which these four subjects are discussed is not related to their importance or dominance. Utilitarianism is really a special form of normativism. Neoclassical utilitarianism is the special form of utilitarianism which evolved out of the Marshall-Clark synthesis of supply and demand determining forces to explain "value and exchange." Normativism, a broader classification, also includes nonutilitarian philosophies *vis-à-vis* goodness and badness. A special form of positivism somewhat paradoxically dubbed "conditional normativism" by the author [Glenn L. Johnson, 1960b] and picked up by Castle [1968] will be discussed in connection with the influence of Gunnar Myrdal [1944]. The work of the International Association of Agricultural Economists (IAAE) was brought to a standstill by World War II and will not be discussed as an aspect of the beginning inventory except under the above four headings, but it will be discussed as important for the post-World War II period.

1. Wisconsin Institutionalism

At the end of World War II, Wisconsin institutionalism was intact, strong, and exerting a major influence. Its then grand old men, its work horses, and its students helped make major institutional changes to improve American agriculture in the depression and World War II era. Richard T. Ely, George S. Wehrwein,

Asher Hobson, O. C. Stine, and many others had carried John Dewey's pragmatic philosophy, which had been built into Wisconsin institutionalism by John R. Commons [1934], into the worlds of politics, administration, and institutional change. Wisconsin institutionalism is, of course, related to the German historical school with its emphasis on "society" and "the state" instead of on the activities of individual consumers and producers. Because of his interest in the state, the influence of Hegel on the German historical school was much greater than his influence on Wisconsin institutionalism. John Dewey's impact on Wisconsin institutionalism made it (relative to the German historical school) more democratic and more participatory for affected persons than German historicism. It is hard to conceive of Wisconsin institutionalists supporting the authoritarianism of either a Hitler or a communist party elite composed of a small proportion of a country's population. Neither are we likely to find it supporting control of large blocks of a country's working population by either a corporation or a union bureaucracy. The decades between the two world wars was a period of great institutional change in the United States and the Wisconsin scholars contributed much. Two of the first post-World War II meetings of the American Farm Economic Association were held in Wisconsin at Green Lake. Then younger institutionalists such as Kenneth Parsons, Ray Penn, Leonard Salter, and Erven Long came to the fore at Wisconsin while John Timmons, Rainer Schickele, and others held forth at other institutions. Charles Stewart, Marshall Harris, and Joseph Ackerman, while not trained at Wisconsin, were influenced by Wisconsin viewpoints.

Historically, Wisconsin institutionalism is pragmatic, the pragmatism coming from John Dewey *via* John R. Commons. Dewey in turn was influenced by Peirce [Dewey, 1938, pp. 9n, 12, 14, 156, 468, 470; Mitroff and Turoff, 1973; Northrop, 1947, ch. 1; Churchman, 1961, ch. 9]. Pragmatism is characterized, first, by the use of the test of workability as a criterion of truth and, second, by the belief that knowledge about good and bad (referred to as *normative* in this review) is dependent for its truth upon the truth of positivistic knowledge (having nothing to do with good and bad), the converse also being true. Pragmatists are interested in right actions to solve specific problems. In their discussion of problems, they do not distinguish between practical problems of decision makers and disciplinary questions (problems); indeed, they rule out by implication the positivistic questions of the biological and physical sciences and the normative questions of the humanities by positing, metaphysically, that answers to positive and normative questions are mutually interdependent. Pragmatists are practical and action-oriented and it was this orientation that Dewey contributed both to institutionalism and American education. The pragmatic interest in knowing which act is the "right" solution to a problem and the belief that purely normative and positivistic sets of information are mutually interdependent make it nonsensical, within the pragmatic philosophy, to pursue answers of questions concerning

goodness and badness independently of the pursuit of answers to positivistic questions [Dewey, 1939; Mitroff and Turoff, 1973, p. 69], and vice versa. Thus, both positivism (which holds metaphysically that there is nothing objective to know about good and bad) and normativism (which holds metaphysically that knowledge of good and bad can be held independently of positive knowledge) are related to pragmatism. Pragmatists address themselves to problems and their solutions—to them knowledge is relevant and true or false in the context of practical problems.

Agricultural economics lost an articulate, competent expositor of pragmatic methods and institutional economics when Leonard Salter [1948] perished in the LaSalle Hotel fire early in the period covered by this review.

2. Cornell Empiricism

At the onset, it must be recognized that Cornell was not monolithic—it had its theorists, normativists, and prescribers. With all that, however, it is also true that Cornell farm management was a center of positivism in agricultural economics before and after World War II. Cornell empiricists were in a strong national position, particularly *vis-à-vis* farm management. Generally speaking, U.S. farm management prior to World War II was dominated by Cornell's empiricism, which can be more nearly characterized as "pure" than as "logical" positivism although such terminology was not used by such critics as John D. Black, T. W. Schultz, and others. Instead of saying that the Cornell empiricists were pure rather than logical positivists, these critics argued that the meaning of empirical observations is greater if theoretically interpreted. The theory Black, Schultz, and others advocated for use in interpreting data was neoclassical utilitarian economics [Schultz, 1939b; Black, 1939].

Cornell empiricism tended to be based upon the writings of Karl Pearson as expressed in his 1900 *Grammar of Science* [Salter, 1948]. Positivism is based on the presupposition that empirical knowledge is derivable only from experience. If restricted only to experience without the use of logic, positivism can be regarded as "pure." If experience is interpreted with logic, "logical positivism" results. A restrictive characteristic of positivism is its acceptance of the metaphysical presupposition that there are no normative experiences of goodness or badness from which to develop primitive terms to use in making empirical (synthetic) normative concepts. The Cornell economists tended to be pure as contrasted to logical positivists. Cornell empiricists did well both administratively and practically. At the end of World War II many of them were heads of departments of agricultural economics and/or farm management, deans, and extension directors throughout the land-grant colleges. Overseas, the Cornell empiricists had important interactions with English, German, French, Scandinavian, and Italian agricultural economists. They were farm- and farmer-oriented both by background and as a result

of data collection activities that kept them in close touch with farmers and their problems. They played important practical roles despite their positivism, which should have precluded their use of normative knowledge both to define and to solve practical problems. Although Schultz [1939a] did criticize them for failing to change the kinds of data they collected as the agriculture economy went through the changing problems of the great depression, the Cornell empiricists were relevant.

3. Neoclassical Utilitarianism

Neoclassical economics found its first full expression, of course, in the works of Marshall in England and Clark in the United States. It explains value in exchange in terms of supply functions based on production costs and demand functions based on utility. As production costs are based on the value of resources in producing alternative products that possess utility, its neoclassical analysis is so strongly influenced by utilitarianism as to make it reasonable to call it "neoclassical utilitarianism." The adjective "neoclassical" distinguishes neoclassical utilitarianism from the utilitarianism of Bentham and others of importance in law, political science, and philosophy which did not explain "value in exchange."

At the end of World War II, neoclassical utilitarianism was not nearly as well established in agricultural economics as it is now. John D. Black was firmly ensconced in a chair at Harvard University as a neoclassical, utilitarian, agricultural, production economist. Henry C. Taylor was primarily a classical or neoclassical utilitarian with emphasis on consumption as well as production economics [Nou, 1967]. Earlier at Cornell, Davenport taught classical and neoclassical economics to agricultural economists including those nurtured in Cornell farm management empiricism. T. N. Carver was in the neoclassical tradition. At Iowa State College, the Department of Economics and Sociology came forward with emphasis on neoclassical, utilitarian economics under the leadership of T. W. Schultz before the oleomargarine blowup scattered its personnel.

It is interesting to note that both Schultz and Black were Wisconsin trained. Neither produced much significant post-World War II literature on research methods although both greatly influenced agricultural economics research methods by their pre-World War II publications and their lifelong teaching. Their teaching was mainly in the neoclassical, market-adjustment tradition. As consultants, however, both were pragmatic. Neither became keenly sensitive to Pareto optimality. Black's methodological contributions were mainly *via* the Social Science Research Council (SSRC) prior to World War II. Schultz's article [1939b] on scope and method was also pre-World War II as was Black's reply [1939]. After World War II, Black wrote on value judgments [1953a]. In doing so he did not consider Pareto optimality. Perhaps because of his contact with pragmatism at Wisconsin, Black did not distinguish in his writings between good and bad on

the one hand, and right and wrong on the other [1953a, p. 293]. At another point [p. 294], he implied that economic value judgments deal with values in exchange while intrinsic value judgments are noneconomic. He distinguished three roles for economists in dealing with values—as investigators, generalists, and administrators.

At the end of World War II, William Murray, Kenneth Boulding, Earl Heady, Geoffrey Shepherd, and Gerhard Tintner were more or less holding the neoclassical, utilitarian fort together at Iowa State pending postwar recovery from the oleomargarine affair. Within agricultural economics, personnel interested in marketing had a sustained interest in neoclassical utilitarian economics. F. L. Thomsen, Warren Waite, Ray Bressler, Geoffrey Shepherd, and marketing economists and price analysts in the USDA operated more or less within the neoclassical utilitarian tradition. At national policy levels, both the Wisconsin pragmatic institutionalists and the utilitarians were important. John D. Black, T. W. Schultz, Murray Benedict, Henry C. Taylor, Howard Tolley, Frederick Waugh, O. C. Stine, and others employed neoclassical reasoning in reaching policy conclusions. The neoclassical utilitarianism used was mainly of the Pigouvian [1932] welfare economics variety [Robinson, 1968]. As the questions about the interpersonal validity of welfare measurements raised by Pareto and worked into economic theory by John R. Hicks [1939] were not yet of concern, the neoclassical utilitarian apparatus was used to reach welfare conclusions without questioning the interpersonal validity of welfare comparisons. In the pre-Hicks decades, progressive income taxation was introduced into the United States and Western democracies. Further, U. S. agricultural economists had just emerged from more than a decade during which they contributed much to decisions about institutional changes designed to redistribute the ownership of many rights and privileges as well as monetary incomes within agriculture and between the farm and nonfarm sectors. While John R. Hicks's book was being read at such places as Iowa State College, it was not generally used and the introduction of "modern welfare economics" was something for the future of agricultural economics [Brownlee, 1948; Tweeten, 1970]. Nonetheless, there were very uneasy feelings among the neoclassical utilitarians; enough positivism had gotten through to agricultural economists *via* Cornell empiricism and contact with physical scientists that agricultural economists were wary about the "scientific objectivity" of dealing with questions of goodness or badness. One way out was to assume answers to questions of goodness and badness and then use the neoclassical utilitarian apparatus to determine how to maximize the difference between the good (sometimes money and sometimes utility) and the bad (again sometimes money and sometimes utility). The tendency to do this was greatly strengthened by Gunnar Myrdal [1944], who recognized that values (knowledge of "good and bad") had to be taken into account in solving practical problems. Though he yielded, perhaps naively, to the positivistic position that values cannot be investigated objec-

tively, he advocated that all value premises be explicitly stated beforehand to develop a method of analysis conditioned by normative assumptions. Analyses so based have been dubbed "conditionally normative" by the author of this paper. Appendix II of Myrdal's *Dilemma* [1944] was assigned by professors of agricultural policy and research methodology in the immediate post-World War II period.

4. Theoretical Statistics and Econometrics

In addition to the Cornell empiricists, groups of statisticians and economists particularly interested in agricultural data collection, parameter estimation, and analysis of problems were developing at a number of locations. At Iowa State College, this development received assistance from Snedecor. At the University of Chicago, Henry Schultz took an early lead with his pre-World War II groundbreaking analyses of agricultural prices. During the war, the Cowles Commission, then at the University of Chicago, extended the domain of econometrics. In the USDA, Elmer Working made substantial progress in demand analysis followed by the work of Mordecai Ezekiel, Richard Foote, F. L. Thomsen, Russell Ives, Meyer Girschick, and others. Mordecai Ezekiel [1930] brought out his widely used book on correlation analysis prior to World War II [Judge *et al.*, eds., 1977]. Earlier at Minnesota and after the war in California, Holbrook Working made substantial progress [Judge *et al.*, eds., 1977]. The statisticians and budding agricultural econometricians responsible for these developments tended toward positivism in their underlying philosophies. They sought to produce positivistic quantitative estimates and, in doing so, avoided the normative as something essentially unknowable or in any event not amenable to quantification and application of probability calculus and mathematics. For the most part econometricians and price analysts seemed to regard prices as positive (probably because they were quantifiable) rather than normative even though anyone with common sense knows that prices are "*values* in exchange." In the immediate post-World War period, this group proved itself so competent in improving estimates and manipulating data that its success and tendency toward positivism concentrated the attention of agricultural economists on positivism.

Chapter III. Developments from World War II through 1976

The postwar period started with a rush. Older members of the profession were anxious to re-establish teaching and research programs while younger men who had not been in the military were anxious to get such work under way and World War II veterans, financed by the G.I. Bill, were anxious to enter graduate study to catch up for the years they had lost professionally to the military. Prior to and during the war period, many experiences pointed to the inadequacies of old ways

of doing things. Leonard Salter [1948] wrote effectively on needs to improve research methods in land economics and in doing so provided an excellent review of the role of philosophy in agricultural economics prior to World War II. There was a widespread desire to improve agricultural economics. These desires and needs were documented in the SSRC's prewar reports on agricultural economics [T. W. Schultz, 1939b]. They were shared by some administrators and were particularly strong among working staff members and students. Graduate work in agricultural economics was re-established at Harvard. T. W. Schultz, W. H. Nicholls, and D. Gale Johnson at Chicago picked up many students who would have gone to Ames before the war and work got under way again at St. Paul, Madison, Berkeley, Urbana, Bozeman, Storrs, Lexington, Raleigh, Ames, etc. At Harvard, John D. Black continued and expanded his group of graduate students. The Farm Foundation, taking a lesson from a successful prewar regional study of livestock marketing, decided to work regionally to improve research methods in the rural social sciences. In this connection, there was close collaboration between Frank Peck, managing director of the Farm Foundation, Noble Clark from the University of Wisconsin, and Joseph Ackerman, who became the new managing director of the Farm Foundation. Under Peck's and then Ackerman's leadership, a number of agricultural economics committees were established. The work of these committees involved philosophic points of view that substantially influenced research methods and philosophy of agricultural economics work [Glenn L. Johnson, 1955; Jensen, 1977]. The land tenure committee tended to be a rallying point or stronghold for pragmatic Wisconsin institutionalists while the farm management research committee became the battle ground *first* between farm management empiricists and Wisconsin pragmatists, and *later* (and much more fundamentally) between empiricists and neoclassical utilitarians [Jensen, 1977]. The farm management extension committee was more dominated by farm management empiricism although pragmatism had its impact on the work of that committee as a result of Dewey's impact on American education and hence, agricultural extension. NCR-20, the North Central Regional Marketing Committee, started out with a heavy emphasis on firm adjustment and efficiency following a market-adjustment, neoclassical, utilitarian approach, modified with an engineering slant originating in part with the engineering training of Ray Bressler [French, 1977].

1. A Short Summary of Agricultural Economics Work, 1946-76

As a prelude to examining the interdependencies between work (research and teaching) and philosophy, a short summary is needed of the work of agricultural economists from 1946 to 1976.

Early in the period there was a heavy emphasis on national policy and commodity programs. William H. Nicholls, D. Gale Johnson, and Frederick Waugh

won the first three of eighteen awards in the *Journal of Farm Economics* price policy essay contest [Nicholls and D. Gale Johnson, 1946]. The essays dealt with price and income measures, and complementary measures in the postwar transition period. T. W. Schultz's *Agriculture in an Unstable Economy* [1945] and D. Gale Johnson's book on forward prices [1947] started the postwar emphasis on policy. This interest in policy problems was continued through the 1950s and early 1960s at the national level by Cochrane, Brandow, Hathaway, and others. John D. Black along with Bonnen and others studied the productive capacity of American agriculture. They placed heavy emphasis on the subject of food, both internationally and domestically. In the same period USDA research focused on subjects relevant to the national agricultural problems and issues of the times as well as on the problems and issues themselves.

Post-World War II farm management research was exciting and dynamic. Neoclassical utilitarian economics was brought to bear on whole farm, enterprise, and enterprise combination problems. Production functions were fitted to cross-sectional, time series, and experimental data [Jensen, 1977; Woodworth, 1977; Day and Sparling, 1977]. Managerial processes were studied and the results transferred to textbooks, experiment station bulletins, and extension reports [Glenn L. Johnson *et al.*, eds., 1961]. Farm management workers also became interested in what their research could contribute to macro policy studies. This interest led to a series of adjustment studies by the different regional committees and to the establishment of the Center for Agricultural Adjustment (CAA) at Iowa State University (ISU) [Jensen, 1977].

The prewar interest in statistics expanded to econometrics, mathematical economics, linear programming, input/output analysis, simulation, etc. By the late fifties, a number of people including T. W. Schultz [1959], the author [Glenn L. Johnson, 1957], Brinegar, Bachman and Southworth [1959], and others sensed that many farm management researchers were losing touch with the problems of farmers and that their work was, first, increasingly disciplinary in nature and technique-oriented, and second, not particularly relevant at either micro or macro levels.

Agricultural marketing received impetus in the postwar period from the Research and Marketing Act. There was emphasis on problem solving through greater efficiency at the individual firm level, i.e., on market adjustment to external changes in institutions, technology, and demand. Bressler's influence led to an early postwar expansion of the economic/engineering approach [French, 1977]. By 1959, an unease appeared about marketing research. Such persons as Robert Clodius, Ray Bressler, and Paul Farris became interested in the impacts of market adjustments on the distribution of property ownership and other forms of market power. An "industrial organization" interest in "structure, conduct, and performance"—in structuralism—developed [Farris, ed., 1964]. Though this in-

terest was pragmatic in some senses, it was somewhat more academic or disciplinary than the earlier firm efficiency work in marketing.

George Brandow headed the Food Commission Study of food marketing in which subject matter relevant to national marketing problems was addressed [1966].

In the 1960s, domestic agricultural economics tended to lose its practical problem-solving orientation. The farm bloc no longer kept practical pressure on the agricultural economists of the USDA. Indeed, O. V. Wells disbanded the old Bureau of Agricultural Economics (BAE), in part, to deconcentrate the agricultural economics budget into a less vulnerable target for congressional cost cutters [Wells, 1954; Hardin, 1946]. Later, disciplinary and technical interests of farm management, econometrics, marketing, and policy researchers tended to eclipse interests in practical problems, either public or private, while the number of farmers declined to the point that people feared farmers might be outnumbered by the agrarian bureaucracy. Later, Roger Gray [1970] wrote a delightful allegory about black-footed ferrets (agricultural economists), an endangered species which fed on prairie dogs (farmers). Gray noted that there was a problem because a federal agency (the USDA) was responsible for protecting the ferrets while it eradicated the prairie dogs. Some feared agricultural economics was dead—the *Journal of Farm Economics* was renamed the *American Journal of Agricultural Economics* in 1968—some wanted to go further and call it a journal of applied social science. The loss of perspective, purpose, and sense of relevance in agricultural economics was probably at its worst when the racial, social, antiwar, and anti-establishment unrest broke out in the late 1960s. This was accompanied and/or followed by environmental concerns, consumerism, and anti-agrarian establishment views. Then came Watergate in 1972, the Egyptian invasion of the Sinai, energy shortages called to our attention by the consequent oil embargo, the elimination of market surpluses of food in the United States, worldwide food shortages, and the grain sales to Russia followed by U. S. export embargoes on grain.

In the remainder of this paper, the changes in agricultural economics that were induced by the upheavals of the late sixties will be referred to as "responses to the crisis of the late 1960s." Seldom does a study area or discipline encounter such an abrupt change. Agricultural economics seemed to go overnight from a shortage to a surfeit of practical problems. Moreover, many of the problems were not amenable to solution by "making the market work better"; instead, their solutions required nonmarket changes in institutions, technology, and people—changes that were not Pareto optimal. It was not that no agricultural economists had worked on problems requiring non-Pareto optimal solutions or that no one was working on them. There was the development work overseas, the poverty commission's work, and the work on the food sector, to mention a few examples. In the late 1960s and earlier, however, agricultural economists had to

respond to: legislatively mandated directives to examine the roles of women; political and social demands to help do something about rural poverty; pesticide and fertilizer pollution; malnutrition among the domestic poor; environmental quality; criticism from labor unions, blacks, women, the aged, and nutritionists; small farmers; land settlement; human capital formation; the extended use of fossil fuels relative to renewable resources; worker alienation; and recycling. In some senses the problems and subjects were not new as many had been considered before and not always in a peripheral way. There was, however, a sharp change from the preceding ten to twenty years. A high proportion of agricultural economists in the late 1960s had spent two decades (or had been trained by people whose main experience was in those decades) seeking Pareto optimal solutions within the market; these analysts now faced new problems requiring nonmarket solutions that were not Pareto optimal. Whether the analysts of the late 1960s and 1970s realized it or not, they were faced with the task of helping decision makers attain enough interpersonal validity in welfare measures to make the essential non-Pareto optimal decisions required to solve the problems facing society.

There was a change from the pre-1967 stream of disciplinary and subject-matter articles in the literature to a concern with the practical. Although this new line of literature is seldom problem-solving in nature, it treats *subjects* important in dealing with sets of practical problems involving the subjects under consideration. This new stream represents a return to relevance with consequent impact on the philosophic interests and/or practices of agricultural economists. This impact of the crisis of the late 1960s is discussed in still more detail in later subsections dealing with "Unease and Loss of Purpose" and "Research Work on Private and Public Decision Making" (see pp. 997-998 and 1000-1008).

2. The Philosophical and Methodological Significance of Selected Developments in Agricultural Economics, 1946-76

In order to examine the crucial relationship between work and philosophy this section examines developments in agricultural economics which have philosophic significance using the above chronological summary of the 1946-76 period as background.

THE POST-WORLD WAR II RISE OF NEOCLASSICAL UTILITARIANISM IN AGRICULTURAL ECONOMICS

The prewar emphasis on neoclassical utilitarianism (defined earlier) of Henry C. Taylor, T. N. Carver, Richard T. Ely, and a small number of other people continued after World War II under the leadership of John D. Black, T. W. Schultz, and others.

The 1946-54 period was a time of administrative disillusionment with farm management, and most departments of farm management were either converted

into agricultural economics departments or merged into subsections of agricultural departments [Jensen, 1977]. For example, at Michigan State College, the old farm management *department* became part of a new Department of Agricultural Economics formed from an agricultural economics *section* that had existed in the Department of Economics. In the new department, the stress was on the use of neoclassical utilitarian economics data. In Kentucky separate departments of farm management and of markets and prices were merged in the early fifties into one department.

At the end of World War II, utilitarianism was well established in marketing and policy work prior to World War II and continued to gain ground in these two areas in the postwar years. The upsurgence of neoclassical utilitarianism was even more pronounced academically than administratively. Almost without exception the postwar departments of agricultural economics found it essential to have staffs and graduate students well trained in neoclassical, utilitarian theory and younger staff members were quick to oblige. Both individuals and departments, too, exhibited considerable pride in attaining such competence. Some empiricists and some others in administrative posts resisted or dragged their feet as agricultural economics adjusted to the increased strength of neoclassical utilitarian economics.

Neoclassical utilitarian economics is, of course, normative as well as positive. Its calculus is devoted to defining optima based upon normative information, both monetary (prices) and nonmonetary (utility), and positive information. The theory prescribes as the "right action" the one that equates marginal costs and marginal returns measured in terms of prices or utility, both of which are normative. The theory maximizes the difference between good and bad, i.e., profits or net utility. The theory is also used to predict or project micro, semiaggregative, and aggregative behavior on the assumption that households and firms behave in a maximizing manner. The neoclassical calculus is normative as well as positive whether used to: define problems and *derive prescriptions* for individual firms or households [Heady, 1949]; *predict* aggregative and semiaggregative behavior at sector, subsector, national or international levels [Swanson, 1971]; or *evaluate* present and past solutions [Brownlee, 1948]. These three uses can be subsumed under *evaluation* (prescription, evaluation, and problem definition) and *prediction* [Spitze, 1965].

Evaluative uses of neoclassical utilitarian economics were drastically constrained by the questions raised by Pareto and by the reformulation of neoclassical utilitarian theory carried out by John R. Hicks in his *Value and Capital* [1939]. Because of Pareto's questions concerning the interpersonal validity of utility or welfare measurements, it became clear that it was empirically dangerous to prescribe neoclassical utilitarian equilibria as maximizing welfare when reaching such equilibria imposes damages on some in order to confer benefits on others. It

was also seen as equally dangerous to use such equilibria to evaluate past and existing situations and to define problems. This narrowed the area within which problems could be defined and solved to those instances in which solutions do not involve imposition of losses on anyone in order to confer benefits on others [Brownlee, 1948, 1950]; such solutions are in theory attainable by the market mechanism. Logically, this kept analysts from using the theory to define and solve some of the most important problems facing society, a situation that became abundantly clear after the social crises of the late 1960s [Buchanan, 1959, 1962]. The compensation principle, if applied, negates attempts to carry out non-Pareto better redistributions. If not applied, the compensation principle leaves uncertainty about the interpersonal validity of a hypothetical substitution of money for an interpersonally valid measure of utility [Dorfman and Dorfman, eds., 1972].

Restrictions on the evaluative use of utilitarian economics resulting from Pareto's argument were not heavily emphasized by practicing agricultural economists in the postwar years when the stress was on agricultural market *adjustment* problems. However, ways were sought to make the overall agricultural economy, farms, and marketing firms and agencies operate more efficiently without redistributing the ownership of resources, rights, and privileges. In instances of damage, resource owners were compensated in various market relocation, irrigation, flood control, and other projects; redistribution of capital ownership did not occur unless there was over- or undercompensation.

The empiricists in farm management had been attacked for not working on the current problems of farmers. Neoclassical utilitarian economics provided a way of defining adjustment problems and an agricultural adjustment center was established at Ames [Heady, 1949]. The deliberations of the North Central Farm Management Research Committee and, at the policy level, the University of Chicago conference on efficiency did not face up to evaluation of nonmarket adjustments to changes in technology, institutions, or human beings in ways that impose damages on some in order to confer benefits on others. Neither did the North Central Marketing Committee (NCR-20) nor did the North Central Soil Conservation Committee (NC-12). Indeed, there seemed to be little general awareness of the difficulties involved in obtaining interpersonally valid welfare measures and of the more general need to obtain objective normative information.

Heady [1962] in a chapter entitled "Criteria for Policy" presented a clear statement on Pareto optimality with some discussion of its limitation and the need to attain interpersonally valid utility measures in dealing with poverty problems. Many accepted Friedman's assertion [1953] that the problems and issues of the day were resolvable mainly with factual information about the positive and that answers to normative questions (presumably other than those concerning

market-determined prices) were unimportant; this reduced attention to policy questions that involved restructuring the ownership of property (in its wide sense, the ownership of rights and privileges). Hathaway [1953] and others dealt with income and freedom as if they had an interpersonally valid welfare measure [Kutish, 1954; Long, 1953, 1954].

Even in the 1950s and early 1960s, there was concern about the valuational particularly with respect to public policy research. In 1950, the conference on efficiency held at the University of Chicago with support from the SSRC produced papers on the subject that materialize (when one cleans out old file drawers) as part of agricultural economics' "phantom literature." O. H. Brownlee's papers [1948, 1950] on the meaning of efficiency made essentially the points later covered by the theory of second best as well as those necessary to reject the Coase theorem. In doing this, Brownlee drew on the literature about Pareto optimality by Reder [1947]. At the same conference John Brewster [1950] presented a paper on efficiency, justice, and freedom in which he went, pragmatically, beyond Pareto optimality. Brewster's and John Baker's [1950] somewhat dissonant papers did not divert the Chicago group from concentration on market adjustment, a productive (but limited) approach that led eventually to theories and empirical work on induced innovations [Hayami and Ruttan, 1970, 1971], induced institutional change, and the formation of human capital [T. W. Schultz, 1971]. It did not, however, lead to evaluation of nonmarket changes in the ownership of property (including all rights and privileges). In a sense, Friedman's conclusion [1953, p. 5] was accepted. He wrote: "Differences about economic policy among disinterested citizens derive predominantly from different predictions about the economic consequences of taking action—differences that in principle can be eliminated by the progress of positive economics—rather than from fundamental differences in basic values, differences about which men can ultimately only fight." Even T. W. Schultz [1959, p. 189] basically agreed:

> Let me simply pay my respects to something called "the objectives of farm policy." I know that there is so much that could be said, but I resist saying it because it has been said over and over again. Then, too the working staff of agricultural economists is, I assume, fairly sophisticated on these issues. True, the beginning graduate student is well advised to take stock of the concepts and thought that have been propounded, for example, on Valuations and Beliefs, the Means-End Schema, Change and Order, Learning Theory, Game Theory, Decision-Making, Policy Formation, and, by no means least for economists, Welfare Economics. Altogether, it is a big cup, good for an early breakfast. It is also quickly drained. It

> assuredly will open one's eyes, get one going, and, as a rule, better oriented than would otherwise be the case. But the hard core of the particular analytical work that needs to be done on farm policy and agricultural adjustments cannot be undertaken with these concepts.

In general economics, the Pareto question was only slightly blunted by the development of the so-called Coase theorem [1960] that asserts the allocative (resource) neutrality of non-Pareto optimal redistributions of rights and privileges (property) ownership. The nonneutrality *vis-à-vis* the distribution of income by redistributing property ownership is obvious. It should have been equally obvious that only under special restrictive assumptions about income demand elasticities could income be redistributed without affecting relative prices and, hence, the allocation of resources. Such allocative nonneutrality cannot be evaluated in the absence of an interpersonally valid measure of welfare (a normative common denominator). This was recognized in the development of the theory of second best [Lipsey and Lancaster, 1956; Harry G. Johnson, 1960; Fishlow and David, 1961], which notes that the Pareto optimum after a change that is not Pareto better is not demonstrably either inferior or superior to the Pareto optimum before the change. This is, of course, consistent with Arrow's analysis of individual preferences and social choices [Arrow, 1951].

Some attention was paid to Pareto, Reder, and Arrow in teaching courses in agricultural economics. For instance, in his teaching at both the University of Kentucky and Michigan State University (MSU), this reviewer expanded Knight's pre-Hicksian assumptions to confine static economics and its evaluative and prescriptive power to Pareto optima. Agricultural policy texts, however, were slow to recognize the strictures of Pareto optimality. The questions raised by Pareto still permit the use of static economics in predicting (as contrasted to evaluating) consequences of non-Pareto better changes in people, institutions, and technology. Though some analysts have been accused of using the Coase theorem [1960] to support the *status quo*, such support would be hard to justify logically as Pareto optimal economics cannot judge the *status quo* to be either inferior or superior to alternatives that are not Pareto optimal.

Though agricultural economists were slow to adopt Pareto optimality, they became increasingly aware of it. This uneasiness slowly reduced the willingness of agricultural economists to define and prescribe solutions that were not Pareto optimal.

In the mid-1960s the deleterious impact of positivism on problem-oriented work continued but was masked by positivism itself. When one believes, metaphysically, that goodness and badness are not experienced and that objective empirical (descriptive) knowledge of them is impossible, a choice between the following is predetermined: try to do objective descriptive and empirical work with concepts of goodness and badness, or accept arbitrarily asserted or assumed con-

cepts of goodness and badness. When forced, a positivist must deal with goodness and badness by arbitrary assumption or assertion. When he does this, he becomes a conditional normativist à la Myrdal [1944] or a mere advocate. The social upheavals of the late 1960s and early 1970s found many agricultural economists choosing between the above alternatives. In effect the powerful arguments of positivism underscored Pareto's questions by asserting that all normative knowledge is nonobjective—not just that which compares the welfare of two individuals. The student activists and concerned noneconomists of the late 1960s saw that serious normative questions about environmental quality, poverty, racism, war, inflation, etc., were going unattended. They acted as if they felt that much more interpersonally valid welfare knowledge was available than was being used. Often without understanding the niceties of economic theory and its associated quantitative methods, they struck directly at the key difficulty.

From the end of World War II to 1967, positivism had expanded its influence in agricultural economics despite the statement in the *International Encyclopedia of the Social Sciences* that "the beginning of World War II marked the beginning of the end of logical positivism as a movement" [Kaplan, 1968, p. 394]. Positivistic tendencies were reflected partially in increased conditionally normative analysis and partially in avoidance of normative investigations. The strictures of Pareto optimally reduced the evaluative power of neoclassical economics [Robinson, 1968]. As will be noted later, the importance of pragmatism, with its emphasis on workability and the interdependence of the positive and normative, decreased in this period.

It is also important to note that relaxation of Knight's assumptions of perfect knowledge and foresight leads to the conclusion that imperfectly informed market decisions which appear Pareto better, *ex ante*, have *ex post* consequences that are not Pareto optimal, in the presence of transfer costs, acquisition costs in excess of selling prices, or salvage value [Glenn L. Johnson, 1960a, 1960c]. This leads to the important conclusion that evaluation of the consequences of market phenomena under uncertainty requires interpersonally valid (normative) welfare measures [Glenn L. Johnson and Quance, eds., 1972].

The need for interpersonally valid normative data took on even greater practical importance with the social and economic unrest of the late 1960s. Market adjustments were obviously inadequate in the face of demands to redistribute ownership of rights and privileges from whites to blacks and other minorities, from rich to poor, from developed to OPEC nations, from developed to Third World nations, from the USDA/land-grant establishment to the biological and physical scientists outside that establishment, from males to females, and from traditional users of the environment to newly emerging claimants. Increasingly, the choice became one of:

(1) trying to work objectively in establishing interpersonally valid concepts of goodness and badness; or

(2) accepting arbitrarily asserted or assumed concepts of the goodness or badness of certain redistributions, without recourse to experience, or logic.

This difficulty is discussed in more detail in later sections of this review.

THE POST-WORLD WAR II UPSURGE IN STATISTICS AND ECONOMETRICS—A STRENGTHENING OF POSITIVISTIC EMPIRICISM

Throughout U. S. agricultural economics, there was a substantial postwar strengthening of statistics and a great expansion in econometric teaching and analysis [Leontief, 1971]. This was evidenced by increased acceptance of journal articles reflecting competence in statistics and econometric analysis. While the initial center of interest in econometrics was in the Cowles Commission, then at the University of Chicago, competence soon developed at Iowa State College, at the University of California, and elsewhere in the land-grant system. There had been a substantial pre-World War II competence in statistics and econometrics in the USDA [Working, 1927; Girschick, 1946] that continued to develop in the immediate postwar years.

This upsurge in statistics and econometrics changed the relationships between agricultural economics and philosophy in part by more than offsetting the reduced attention to positivism that resulted from reduced emphasis on Cornell positivistic farm management. Perhaps this change is best seen by discussing statistics and econometrics separately.

The increased interest in and emphasis on theoretical statistics grew out of the long-standing quantitative work of agricultural economists. Statistics as a discipline had much to offer to improve the quantitative techniques of agricultural economics in the post-World War II period. At the same time, agricultural economists were being influenced increasingly by positivists and positivistic arguments holding that there are no normative experiences and that, hence, normative information cannot be descriptive or quantified for statistical treatment. From this point, it is but a short *non sequitur* to the unthinking conclusion that statistics is positivistic and the unconscious acceptance of positivism as an apparent accompaniment of statistics.

Econometricians have—as an avowed purpose—the joint use of mathematics, statistics, and economic theory as appropriate in studying economic phenomena [Marschak, 1953]. The economic theory employed by econometricians was largely of the neoclassical utilitarian and Keynesian varieties. When econometricians use this theory to *develop* aggregative or semiaggregative models of (and to *predict*) supply and demand responses, they assume that the maximization behavior of neoclassical, utilitarian economics is characteristic of firms, households,

and resource owners. These theories are normative in that utility functions and prices are normative. Maximization and minimization processes deal with the attainment of utility (or some other good or subgood) and the avoidance of disutility (or some other bad or sub-bad). Thus, the work of econometricans is not as positivistic as some of the earlier joint work of statisticians and farm management researchers.

However, it is interesting to note that the supply response studies of econometricians were often labeled normative, with the word being used as an epithet by positivistically inclined supply and demand analysts. These analysts wanted what they termed "predictive" or "behavioral" supply and demand estimates rather than "normative" or "prescriptive" ones [Glenn L. Johnson, 1960a; Swanson, 1971]. As econometric supply and demand functions predicted behavior on the basis of the maximizing theory of neoclassical economics, the critics probably wanted different kinds of predictions and different behavioral assumptions. They seemed to believe that predictive or behavioral estimates could be obtained but that estimates of the consequences of human behavior that take motivation into account can be neither behavioral nor predictive! Their positivism seemed to preclude the possibility that anything normative could be empirical, descriptive, or predictive of anything "real" or objective.

In agricultural economics, developing quantitative expertise augmented the tendency toward positivism. Together they seemed only another important part of attaining academic excellence in the late 1940s, the 1950s, and early 1960s. Policy, farm management, and marketing analysts wanted reliable estimates of the important parameters of neoclassical utilitarian theory to use in their adjustment studies. Prior to the late 1960s many agricultural economists became increasingly positivistic without noting the adverse impact of their positivism on the ability to define and solve problems [Buchanan, 1962] whose solutions required nonmarket adjustments.

PRAGMATISM AND INSTITUTIONALISM ON THE DEFENSE

Despite its strong prewar record and the substantial contribution of pragmatic Wisconsin institutionalists during the World War II period, pragmatism and institutionalism were put on the defensive by the postwar strength (as described above) of the neoclassical utilitarians and positivistic statisticians, and econometricians.

The neoclassical utilitarians took an early post-World War II offensive in the North Central Farm Management Research Committee. This offensive overcame the empiricism of the farm management workers and tended to stifle pragmatic interests. By the end of the second North Central Farm Management Research Workshop at Black Duck in 1949,[2] the stage was set for a heavy emphasis on neoclassical utilitarianism in farm management research. In turn, the progress

and/or changes made in farm management by the neoclassical utilitarians created aggressive competition with academic pressure on the pragmatists in the land tenure committee and on the practicing Wisconsin institutionalists and land tenure researchers throughout the land-grant system. A rather natural affinity between neoclassical utilitarians, on one hand, and statisticians and econometricians, on the other, strengthened neoclassical utilitarianism while the lack of such affinity weakened the pragmatic position. The pragmatists had trouble combining their somewhat clumsy though comprehensive methods with the relatively simple, straightforward methods of statistics and econometrics. Their trouble stemmed in part from their use of the workability criterion and in part from their somewhat haphazard stress on the interdependence between normative and positive truth. The methods of the pragmatists were well suited for working on ill-structured problems but unduly complicated for relatively well-structured problems of interest to the utilitarians [Mitroff and Blankenship, 1973].

Conditional normativism was a natural sort of adjustment to positivism which was superficially easier than pragmatism for persons concerned with simple, well-structured problems involving stable, well-known, and noncontroversial values. K. H. Parsons later [1958] attacked conditional normativism as "opening the way for a reversion to the medieval view that the world of thought and action should be organized around social values presented to mankind as dogma." As a pragmatist, K. H. Parsons objected to normative assumptions—he believed that both normative and positive truth are revealed interdependently in the *process* of defining, studying, and solving problems [K. H. Parsons, 1949]. Parsons was uncomfortable with the positivism that causes conditional normativists to avoid normative investigations by making normative assumptions instead of letting normative knowledge emerge, interactively and interdependently (dialectically), with positive knowledge out of problem-solving processes.

The literature of the late 1940s, 1950s, and early 1960s contains a substantial number of statements expressing pragmatic, institutional points of view at some variance with those of the upsurging utilitarians and econometricians. Included here are works by Bushrod Allin [1948, 1949], Erven Long [1952, 1953], Maurice Kelso [1949, 1965a, 1965b], John Timmons [1959], and John Brewster and H. L. Parsons [1946], to mention a few examples.

DISCIPLINARY EXCELLENCE VS. PROBLEM-SOLVING AND SUBJECT-MATTER EFFORTS

By the mid-1950s, much greater disciplinary excellence as economists had been attained by agricultural economists than in the prewar years. Knowledge of economic theory was greater and more extended. Quantitative work including estimation of the parameters commonly encountered in economic theory was

greatly improved; however, as disciplinary excellence increased, problem-solving and subject-matter research probably lost ground absolutely as well as relatively.

Farm management, marketing, land tenure, and price research, etc., lost academic status unless "enduring contributions" could be made to economic theory and quantitative techniques. Problem-solving research was increasingly denigrated as short-term "brush fire" effort. These trends developed in the late 1950s and 1960s when the profession was moving toward neoclassical utilitarianism and was defining problems increasingly in terms of market disequilibria and trying to solve them by re-establishing equilibria. This emphasis led to the neglect of a whole class of problems by agricultural economists, i.e., those not solvable by the market. The emphasis on market adjustment was compatible with excellence in economics and associated quantitative techniques. This stress on market adjustment combined with the additional tranquilizing effect of a lack of interest on the part of political farm organization leaders in nonmarket adjustments to mask the consequences of reduced attention to problems beyond the market place.

In 1956, an SSRC meeting was held under the chairmanship of Brooks James. It was based on reports from earlier seminars and conferences in eight agricultural economics departments or sections in academia and in the USDA. The main emphasis was on problems solvable through market adjustments. However, reports from Minnesota, Wisconsin, and Michigan State did call attention to distributional and equity considerations (other than agriculture *vs.* the remainder of society) and valuations and values. The summary, which is part of the phantom literature, noted that "the philosophic literacy of agricultural economists with respect to value problems might well be examined." It was also noted that "some of the younger men . . . had been giving increasing attention to valuation problems and valuation conflicts as they bear on policy and policy making" [SSRC, 1956, pp. 54-56].

In the late 1950s, George Brinegar chaired a special subcommittee of the SSRC on agricultural economics. That subcommittee worked cooperatively with the executive committee of the American Farm Economics Association. An article entitled "Reorientation in Research in Agricultural Economics" [Brinegar, Bachman, and Southworth, 1959] was published. That article diagnosed the ills of agricultural economics as being the consequences of its low productivity. It was argued that "we are failing to measure up to the present challenge, and will continue to do so unless and until we can direct our thinking to new and broader formulations of problems as they now press upon us" [p. 602]. Reasons for the failure were ascribed to fragmentation into disciplinary and subdisciplinary interests—fragmentation which doesn't develop "systems of thought" *vis-à-vis* problems; inadequate research methods; and lack of attempts to develop "subject-matter compilations." F. S. C. Northrop's [1947] book was highly

recommended by the Brinegar subcommittee. The report did not deal with the relationship between problem definitions and solutions (prescriptions), on the one hand, and concepts of goodness and badness, *per se*, on the other. Perhaps because this relationship was ignored, little stress was placed on methods for working with the normative in defining and solving problems. Northrop's failure [1947, pp. 328ff.] to distinguish between prescriptive knowledge and our past and present normative experiences was not seen as a limitation when his book was recommended to agricultural economists by Brinegar, Bachman, and Southworth [1959].

Shepherd [1956] wrote meaningfully about what researchers can say about values. His somewhat eclectic statement reflected pragmatic as well as positivistic and conditionally normative methods. When Ciriacy-Wantrup [1956] wrote about policy considerations in farm management research with attention to Pigou and Pareto, he did not distinguish between prescriptive and normative as was done earlier in this review. As a result his article was somewhat ambiguous. He labeled the maximization principle a "scientific fiction" and noted shortcomings of Pareto optimality. His article had the distinct merit of recognizing the inadequacies of national income and Pareto optimality as criteria for policy choices *vis-à-vis* nonmarket adjustments. Brandow [1955] recognized the need to work with values but was of little operational help.

Subject-matter research on such subjects as land tenure, farm records, time and motion, econometrics, farm management, and marketing (as subjects), etc., lost ground to disciplinary interests. Even the "revolutions" in these subject areas were disciplinary; witness the "structure, conduct and performance" transformation in marketing. In econometrics, as practiced by agricultural economists, the interests were in more advanced parameter estimation techniques, lagged adjustment coefficients, distributed lags, etc. Farm management researchers were more interested in integer programming, decision making, fitting production functions, recursive linear programming, and asset fixity than in the problems of farmers solvable outside of the market place. Simple, well-structured systems [Mitroff and Blankenship, 1973] were researched with well-established techniques. Complex, ill-structured but important problems were avoided or neglected.

When U.S. agricultural economists changed their work, they also changed the name of their professional journal from the *Journal of Farm Economics* to the *American Journal of Agricultural Economics*. The *AJAE*, continuing a situation that had developed before its name change, concentrated increasingly on the disciplinary—the theoretical and the quantitative—and became smaller than the JFE of the more immediate postwar years. Articles dealing with solutions of specific problems of farmers, agribusinessmen, and public officials occupy a smaller proportion of space than in the "Sears Roebuck catalog" proceedings and regular

issues of the old *JFE*. Disciplinary quality has clearly increased. Significant changes in the quality of subject-matter and problem-solving research are hard to detect in *AJAE* articles, perhaps because the sample size is so small! Since 1967, as will be seen later, the quantity and quality of problem-solving and subject-matter research published outside the *AJAE* have increased.

In the late 1950s and early 1960s, concentration on the disciplinary increased the emphasis on the positive and, if values were considered at all, on monetary as opposed to nonmonetary values. One of the exceptions to the emphasis on monetary values was the interstate managerial study [Glenn L. Johnson *et al.*, 1961] within which Halter's disciplinary work measured the utility of wealth and income cardinally with techniques developed by von Neumann and Morgenstern [1947] and Friedman and Savage [1948]. These measures were not interpersonally valid insofar as the unit of measurement was concerned; however, interpersonally valid comparability of inflection points and other characteristics of the utility function was attained. Halter spread his interest in utility measurement to California and Australia during sabbatical leaves [Halter and Dean, 1971]. Since then Dillon and Anderson [1971], Anderson, Dillon, and Hardaker [1977], and others have published extensively on utility measurement and the expected utility hypothesis as a decision rule.

It is interesting to note that utility measurement is sometimes regarded as positivistic despite the fact that a nonmonetary value, utility, is being measured. Part of the confusion arises from failing to distinguish the normative (good and bad) from the prescriptive (right and wrong) or what "ought" or "ought not" to be done [Machlup, 1969; Lewis, 1955; Moore, 1903]. Another part of the confusion arises from the positivistic presupposition that nothing normative can be experienced and, hence, measured. This leads to the strange conclusion that utility must be positive if it is measurable. The same argument seems to apply to the conclusion that prices are positivistic.

UNEASE AND LOSS OF PURPOSE

Though the literature contains earlier statements of unease with the trend toward the disciplinary and the positive [Allin, 1948, 1949; Mitchell, 1949; Conklin, 1947], the criticism of the 1960s became more telling. As previously pointed out, the pragmatists were always uneasy with the trends. K. H. Parsons [1958] expressed his uneasiness at a North Central Farm Management Research Committee meeting. Maurice Kelso's critical appraisal of agricultural economics [1965a] elicited methodological and philosophical comments from Brown [1965], Grove [1965], Mighell [1965], Reinsel [1965], Schmid [1965], Spitze [1965], and, in turn, further comments from Kelso [1965b]. After noting remarkable disciplinary advances, Kelso indicated that we had not advanced our predictive and problem-solving capacity correspondingly. He felt that we had become "more exact, more positive, more

quantitative, more complex in our rationalistic analysis of hypothetical, simplified, imaginary systems from which man—as a partly irrational, unpredictable, emotional animal—is banished to be replaced by the lightening [*sic*] calculator in human form."

The "adjustment" orientation of the North Central Farm Management Committee [Heady, Diesslin, Jensen, and Glenn L. Johnson, eds., 1958] left problems involving nonmarket solutions unattended. Cases in point are problems involving conservation, taxation, land-use regulation, publicly supported technological research, price supports, income taxes, social security for farmers, unemployment compensation, foreign commodity and technical aid, regulation of pesticide use, etc. The regional farm management extension committees did better than the research committees on taxation, social security, and labor use regulations. These and other considerations left the author of this review uneasy and led to his investigation of philosophic questions concerning how to research the normative objectively [Glenn L. Johnson, 1960b, 1961b, c, 1963a]. This investigation indicated that essentially the same kind of objectivity was attainable for normative as for positive knowledge.

By the early 1970s, questions about the worth of the discipline-like work of the regional research committees led to their partial abandonment. As will be seen later, this was part of the response of agricultural economists to the crises of the late 1960s. Recent attempts to re-establish the regional research committees in the midwestern states, like their earlier abandonment, have done little to improve the problem-solving and subject-matter work of regional committees. Perhaps this failure is due to perceiving the difficulty as one of inappropriate personnel on committees rather than of administrators unable or uninterested enough to shift the emphasis to problem-solving work.

THE RESURGENCE OF PRAGMATISM AND INSTITUTIONALISM

Kenneth Boulding is reputed to have once characterized institutional economics as a combination of poor sociology and bad economics. However, by the time he delivered his presidential address before the American Economic Association in 1968 he had changed his mind and was essentially an institutionalist [Boulding, 1969]. What happened to Boulding also happened to some agricultural economists. Solving problems with market adjustments within a neoclassical Pareto better context left serious problems of conservation, poverty, racial inequality, environmental quality, minority rights, etc., unattended by the utilitarians and market adjusters. This permitted pragmatic institutionalists to score points again with their ability, cumbersome as it was and is, to define and at least participate in the processes of solving problems whose solutions inevitably seem not to be Pareto better. As problems involving environmental quality, poverty, and ownership of rights and privileges by minority and majority groups, etc., came to greater prominence in the latter part of the 1960s, the limitations of conditionally

normative and/or Pareto better, market-adjustment studies became more and more apparent.

In this period, John Brewster in the USDA placed heavy emphasis on pragmatism. Earlier, Brewster had participated with others in bringing G. H. Mead's pragmatic papers to posthumous publication under the title *Philosophy of the Act* [Mead, 1938]. In turn, in 1970, J. Patrick Madden and David E. Brewster brought John Brewster's writings together in a book entitled *A Philosopher among Economists* [J. M. Brewster, 1970] under the sponsorship of a committee including such USDA agricultural economic leaders as Frederick Waugh, Kenneth L. Bachman, Willard W. Cochrane, and Harry Trelogan and with the support of the Farm Foundation. While the preface denies, for reasons not made clear, that Brewster was a pragmatist, his essays and bibliographies reflect much of the pragmatic thought of G. H. Mead, Charles S. Pierce, William James, and John Dewey, particularly the emphasis on "social awareness and commitment" and on beliefs and values as being as interdependent as "the two sides of a coin" [J. M. Brewster, 1970, p. 11]. Though at times conditionally normative, Brewster was pragmatic in relating values to particular problem solutions, crises, and periods of time. He also showed how values affect one's positivistic views of reality. His 1964 seminar, "Philosophy: Principles of Reasoning Especially Applicable to Science," contained little pragmatism and, indeed, ignored the normative while concentrating on creative discovery of conflicts between "prevailing generalizations and exceptional observations" [J. M. Brewster, 1970]. In his chapter on philosophy, in his life, and in other writings, however, Brewster concentrated on conflicts with respect to the problems and issues of society in a manner consistent with pragmatism. In Brewster's lifework, pragmatism and/or normativism were used in working with the value dimensions of the social problems and issues with which he was concerned. In practice, Brewster went beyond conditional normativism to pragmatism. He did not extensively consider the possibility of objective nonmonetary, normative knowledge independent of positive knowledge, following Moore [1903] and Lewis [1955]; hence, he was more of a pragmatist than a normativist. Brewster's vagueness *vis-à-vis* working with the normative in considering societal problems and issues was continued in a USDA publication entitled *Beliefs and Values in American Farming* [Gulley, 1974]. That report contrasts factual with normative beliefs thereby implying, positivistically, that normative beliefs (such as those about price levels or about such nonmonetary values as the goodness of life or the badness of racial inequality) are not "facts." Further, "goodness" is confused with what "ought not to be done" (the prescriptive) without seeing that we sometimes "ought not to" bring into existence that which is good if something better can be brought about at the same cost. Both Brewster's and Gulley's works reflect the confusion in our discipline, so well summarized by Machlup [1969], of values (the normative) with the prescriptive. Each,

however, has the virtue of concern with societal issues and problems supported with enough pragmatism to go beyond positivism and conditional normativism in helping public (and private) decision makers solve their problems.

Boulding's recognition of institutional economics and pragmatism also appears in his book *The Image* [1956]. He states that the processes whereby one forms positive and normative images are not essentially different [p. 173] and are pragmatic [Boulding, 1969]. Work by this reviewer also represented a considerable acceptance of pragmatism [Glenn L. Johnson, 1970]. The resurgence of pragmatism in the late 1960s was substantially constrained by positivism (including conditional normativism).

RESEARCH WORK ON PRIVATE AND PUBLIC DECISION-MAKING PROCESSES

In the postwar period there was considerable interest in decision-making processes at both private and public levels. Much of the postwar interest in private decision-making processes grew out of Frank Knight's *Risk, Uncertainty and Profit* [1921]. Before the war, T. W. Schultz [1939b] had urged farm management advocates and production economists such as John D. Black to pay more attention to risk, uncertainty, and management processes. It was not until he published his *Introduction to Economics for Agriculture* [Black, 1953b, pp. 72ff.] that Black had a section on risk and uncertainty. His earlier farm management effort [Black, Clawson, Sayre, and Wilcox, 1947] was devoid of risk and uncertainty theory. Nor did it deal with how expectations affect decisions or how farm managers learn (either positively or normatively).

D. Gale Johnson [1947], however, responded to the Schultz [1939b] admonition by using the Knight analysis of risk, uncertainty, and profit to develop the idea of forward prices for American agriculture as a means of reducing price risk. Also, empirical work at Iowa State on risk and uncertainty was contained in Heady's production economics text [1952].

The neoclassical production economists, who replaced the Wisconsin pragmatists in the Land o' Lakes/Black Duck debate with farm management empiricists, also developed interests in risk, uncertainty, expectations and managerial processes [Glenn L. Johnson, 1950]. Their work went forward largely under the auspices of the North Central Farm Management Research Committee, which inaugurated the Inter-State Managerial Study (IMS). North Central farm management researchers interested in managerial processes were largely conditionally normative. At the beginning at least [Glenn L. Johnson, Halter, Jensen, and Thomas, eds., 1961], their interest in managerial processes was not a pragmatic, dialectical one. As a result of a conditionally normative orientation, IMS investigations of the managerial process dealt largely with how managers accumulate positivistic kinds of information and use it in making decisions, the main

exception being price information. In subsequent stages of the IMS, it became clear that information about nonmonetary values as well as positivistic information is accumulated by managers in reaching prescriptions as to how to solve their problems. It also became clear that the managerial processes were sometimes pragmatic in nature with normative and positivistic truths being interdependent in the context of the problem being defined and solved. The IMS did much to deepen interest in normative and positive epistemologies and in the processes for reaching prescriptive decisions.

At the University of Missouri, the "balanced farming" approach to extension took hold. This approach to agricultural extension recognized the interrelationships between production and consumption in farming. When generalized to other states in the 1950s, the approach was known as "farm and home development." The emphasis on the home or consumption side of farming stressed the normative and, within the normative, nonmonetary as well as monetary values. The necessity of dealing with consumption as well as production—with expenditures on living as well as expenditures on production and investments—in farm planning and budgeting clearly involved the normative. By the 1960s the farm and home development approach to farm management extension had more or less withered away administratively, especially in the principal Corn Belt states where agriculture is more profitable. In these states, production and consumption are more separable and, whether separable or not, production is important enough to be studied independently and in its own right. This permitted considerable positivistic and conditionally normative farm management work to proceed with some success, uncomplicated by pragmatic and normativistic philosophies. Such work produced little formal understanding of decision making. However, extension farm managers less hampered by philosophic constraints did much to develop in *practice* the processes of working interactively and iteratively with farmers in answering both the positive and normative questions that determine prescriptions as to what "ought to be done."

Though small farms were studied more or less continuously from 1946 to the present [Heady, 1952, ch. 13; Heady, Back, and Peterson, 1953; Wilt, 1957], the "small farm" has recently been "rediscovered" [Thompson and Hepp, 1976]. In a research and extension movement reminiscent of the O. E. Baker, Borsodi, and Wilson depression book, *Agriculture in Modern Life* [1939], part-time farms, rural residences, and hobby farms were being studied. Such studies required the capacity to work objectively with the normative, particularly nonmonetary, values, if one was to understand the economics of such farms, which involve consumption as well as production.

At the public level, John D. Black at Harvard had become deeply interested in agricultural extension administration and conducted a program for training agricultural administrators that stressed administrative processes. Being concerned with administration, the Harvard program was less positivistic (and therefore less

scientific in some views) and less disciplinary than the mainstream of agricultural economics of that time. As such, it involved an attention to values and prescriptions that were probably at some variance with the research methods Black taught if not with his practices as consultant and adviser. There was a connection with Wisconsin institutionalism *via* Gaus (in the Department of Government at Harvard), who, like Black, was trained at Wisconsin [Gaus and Wolcott, 1940].

A somewhat different situation prevailed in the Department of Agricultural Economics at Purdue University under the leadership of Lowell Hardin (and his predecessors and successors). Purdue's eclectic, multidisciplinary approach to farm management made that department a leading trainer of personnel for farms and agribusiness firms. This development seems to have been an outgrowth of close contact with farmers and agribusinessmen and their *processes* for solving problems rather than of commitment to pragmatism or more normativistic philosophies. At Michigan State, the new Department of Agricultural Economics under Thomas Cowden and the extension leadership of John Doneth preserved much that was of value out of the Cornell farm management approach.

In the late 1940s, 1950s, and early 1960s, such then newcomers to the fields of agricultural policy as D. Gale Johnson, Cochrane, Halcrow, Brandow, Hathaway, and Bonnen joined such stalwarts as Black, Schultz, Wilcox, Stine, Benedict, Clawson, and others. Also, policy work was done both domestically and abroad by persons such as Heady, Back, Sorenson, Gray, Hillman, this reviewer, and others.

In the 1950s and 1960s, most books on agricultural policy did not consider Pareto optimality and the need for interpersonally valid welfare measures. This included policy books by Hathaway [1963]; Clawson [1968]; Heady, Haroldsen, Mayer, and Tweeten [1965]; Halcrow [1953]; and Wilcox, Cochrane, and Herdt [1974]. Schickele [1954] paid more attention to values. Hathaway's book distinguished between values and prescriptions, as defined in this review, but then translated values into a list of goals (prescriptions still to be executed) virtually the same as the values from which they were supposedly derived in view of the constraining nature of positive reality. Walter Wilcox [1956] also wrote on ethics. In summary, the policy literature of the period provides few clues as to how to work objectively with values in solving policy problems.

A conference on goals and values in agricultural policy, sponsored by Iowa State University's Center for Agricultural and Economic Development [ISU, CAED, 1963], gave only slight attention to Pareto optimality and still less to important methodological issues of how normative questions can be objectively researched. Brownlee [1961], in discussing Markham's paper [1961], did bring out a little about the limitations of Pareto optimality. This reviewer, in discussing a paper by Bishop and Bachman [1961], expressed concern that the conference was not well organized to address the normative [Glenn L. Johnson, 1961b]. Kaldor

and Hines [1961] noted that they were unable to coauthor an assigned paper with Ward Bauder on goal conflicts in agriculture because integration of "sociological and economic approaches" was not possible in "the time at 'their' disposal." Kaldor and Hines did not deal with Pareto optimality, lack of interpersonally valid welfare measurements, or, for that matter, methods for working objectively with values—theirs was mainly a market-adjustment approach. A subsequent CAED conference [ISU, CAED, 1963] attempted to rectify the shortcomings of the first conference. That conference placed heavy emphasis on religion and religious leaders but did not investigate the question of how to derive normative knowledge from experience and the use of logic in an objective manner.

Tweeten [1970] produced an agricultural policy book that fully incorporated the Pareto concepts of Hicks [1939] as expounded by Reder [1947], Scitovsky [1951], and Arrow [1951]. In addition it had substantial empirical normative content [Tweeten, 1970, ch. 1-4]. This descriptive normative content drew heavily on sociological [Burchinal, 1961], political [Talbot and Wiggins, 1967], and historical studies [Benedict, 1953]. Unfortunately, and unlike Hathaway's earlier book [1963], Tweeten's effort did not distinguish between the normative and prescriptive; i.e., he used the word "goals" ambiguously to mean both or either. However, his goals were similar to those delineated by Hathaway. Because Hathaway tended to lose the distinction by the time he translated values (the normative) into goals (prescriptions not yet executed), the similarity is not surprising. The theoretical presentation [Tweeten, 1970, ch. 16] concentrated largely on Pareto optimality and, hence, market adjustments to attain "economic efficiency." The limitations of Pareto optimality and economic efficiency as stated by Brownlee [1950] at the Chicago efficiency conference were not stressed by Tweeten—neither was the re-expression of those limitations as the theory of second best [Lipsey and Lancaster, 1956]. Further, normative philosophies and epistemologies were not seriously considered [Moore, 1956; Lewis, 1955; Dewey, 1938]. Again, the reader and student were left without assistance in working objectively with the normative. In a bow to positivism, Tweeten [pp. 502-503] implied that the valuable normative contents of his chapters 1-4 are of questionable objectivity. In effect he backed off from Pareto optimality and its modifications but not to an objective normativism or pragmatism for handling problems "solvable" only with nonmarket changes in institutions, humans, and technology, changes that violate the Pareto optimality criteria.

In addition to the literature on national agricultural policy considered above, there is a literature on state, local, and international decisions and policies. This literature deals with market adjustments and with nonmarket changes in institutions, technology, and people. Such literature ranges from problem solving through subject matter to the disciplinary with, perhaps, its greatest concentration falling on subject matter.

By the first half of the 1970s, four different streams were detectable. *One* stream involved systems analysis in its broad, general sense [Halter and Miller, 1966; Manetsch *et al.*, 1971]. This stream's intellectual ancestry includes cybernetics and the work of systems scientists and is related to optimal control theory. In the general systems-simulation approach, emphasis is placed on "state, policy, behavioral and criteria" variables, the latter being normative and of use in evaluating systems performance. This stream becomes pragmatic and dialectic but is still scientific in the broad sense.

A *second* stream was generated by the market structuralists [Farris, ed., 1964]. It was concerned with "structure, conduct and performance," first with respect to markets and later with respect to government as well as markets (note the correspondences between state and structure, behavior and conduct, criterion and performance). A notable application in this stream was a study of the northern California water industry by Bain, Caves, and Margolis [1966], published by Resources for the Future (RFF). In effect the word "market" was magnified to include all of economics in changing institutional, technological, and behavioral settings.

The *third* stream was developed by persons responding to the crises of the late 1960s [Castle, 1972; Libby, 1971; Randall, 1972; Dorner, 1971; Bawden, 1972; Bieri, de Janvry, and Schmitz, 1972; Kelso, 1968]. As noted above, pragmatically oriented agricultural and general economists were more prepared philosophically, and better equipped methodologically, to address themselves to these issues than their more disciplinary counterparts who emphasized market adjustment, Pareto optimality, positivistic quantitative techniques, and conditional normativism. Their preparation was based on earlier works such as those of Margolis [1957] and Buchanan [1962] as well, of course, as the much earlier work of the Wisconsin institutionalists. Some pointed out that agricultural economics had in fact been working on small farms, technological change, poverty, energy, environmental quality long before 1967—and they are correct. However, the emphasis changed in the late 1960s—after 1967 these topics become proportionally more important and a part of the mainstream of agricultural economics thought.

The *fourth* stream of work involved agricultural information systems as one aspect of public and private capacity to analyze and solve problems. After 1969, a committee of the AAEA chaired by James Bonnen addressed itself to the adequacy of the U.S. agricultural economics information systems [AAEA Committee on Economic Statistics, 1972; Bonnen, 1975]. Results of this work were presented in congressional testimony [U.S. Congress, JEC, 1974; U.S. Congress, OTA, 1976a] and were considered in the Office of Technology Assessment's review of agricultural information systems [U.S. Congress, OTA, 1976b]. The information in the U. S. agricultural information system is both positive and normative, the latter dealing mainly with prices, income, and expenditures. Karl Fox

[1974] attempted to measure nonmonetary values (in terms of dollars) to permit him to expand GNP into a concept of gross social product (GSP). Fox's work on the normative helped to repair neglect of that aspect of information systems by general and agricultural economists. Other neglected aspects included the role of markets and political systems as mechanisms for transmitting normative information. Also, little of the literature on information systems has considered iterative interactions between investigators, on the one hand, and decision makers, executives, and those responsible for decisions and action, on the other. At the private level, practical farm management advisers know the importance of iterative interaction as a source of both positive and normative knowledge. At the public level, practical consultants and advisers have a similar awareness. Perhaps the connection between information systems and cybernetics (with its positivistic background) is too close to expect much consideration of the normative in the iterative, interactive processes of reaching prescriptions to solve problems [Dunn, 1971].[3]

The first three of the above four streams were concerned with structure (state), conduct (behavioral), and performance (criteria) variables. All four were normative as well as positivistic. As the general systems-simulation approach derives from cybernetics and engineering (with its close association with positivistic physics and chemistry), it is not surprising that the approach often takes several criterion valuables as given in a sort of "multiple conditional normativism." Similarly, in view of the upsurge of positivism in agricultural economics after World War II, it is not surprising that market structuralism tends to take performance variables as "givens." The similar tendency of the more pragmatic investigators, who responded to the crisis of the late 1960s and 1970s with structuralist or industrial organization approaches, seems to reflect the defensive posture of pragmatism and the resurgence of positivism in the 1960s. All three streams produced research results on such subjects as poverty, environmental quality, transportation, and development in general. The conditional normativism involved in taking a preselected list of performance or criterion variables as given is less of a constraint on subject-matter research than on problem-solving research where participatory *interaction* between investigators and decision makers (including affected people) *modifies* the list of criterion or performance variables *in the dialectical process of* solving the problem.

The U. S. developed its national agricultural accounts and ability to make associated macro agricultural projections in the 1920s and especially in the 1930s. This was in response to urgent agrarian problems of direct concern to the then dominant "farm bloc." As the bloc controlled USDA appropriations, interactions among bloc leaders, members of the executive branch, and researchers were close and iterative. The national accounts, associated indexes, and other measures were, in effect, a "U. S. agricultural sector model." This model related state, be-

havior, and policy variables to *projections* of criteria or performance variables. The performance variables were numerous and were used to indicate consequences of non-Pareto better changes in price supports, production controls, food stamp programs, credit subsidies, and new credit institutions. In general, this model and its associated data systems have remained the principal way the USDA has provided congressional and executive branch decision makers with projections. This general model has been supplemented with numerous more specific econometric models within the USDA and in studies done largely in association with ISU and to a lesser extent elsewhere. Parts of the USDA's general model were formalized on computers, an example being the National Interregional Agricultural Projection (NIRAP) model developed under the leadership of Quance [Boutwell et al., 1976].

Econometric and linear programming (LP) models are more highly specialized on economics and maximization than are the U. S. agricultural accounts and associated indexes and measures. The econometric and LP models assume maximizing behavior in making projections or producing prescriptions, both of which involve the normativism of neoclassical economics. Further, economic models incorporate fewer biological and institutional variables. They also pay less attention to the consequences of nonmaximizing behavior than do the more eclectic "models" composed of the national agricultural accounts and associated indexes and measures. Perhaps it was these limitations that kept modern, more specialized models from more fully replacing the projections based on agricultural accounts and associated statistics.

Somewhat similar to the national accounts "model" was the work of John D. Black and James Bonnen [1956] in projecting the productive capacity of American agriculture. Their eclectic effort drew heavily on technological, institutional, and behavioral information. Like most 1950-70 textbooks on agricultural policy, it tended to be in the neoclassical tradition yet it did not subject itself to the strictures of Pareto optimality or conditional normativism and did not attempt to reduce all values to a common denominator. The joint RFF/MSU 1917-65 study of the U. S. agricultural economy [Glenn L. Johnson and Quance, eds., 1972] was somewhat similar to the Black/Bonnen effort in that it too avoided heavy emphasis on maximization, the strictures of Pareto optimality, and conditional normativism. At a less macro level, the Mighell/Black study of dairy adjustment was also philosophically and methodologically eclectic [1951]. The author is under the impression that the national accounts model, the Black/Bonnen effort, and the Mighell/Black effort attained greater credibility with decision makers than more specialized, less eclectic efforts such as the Lakes State Dairy Adjustment Study, the North Central Feedgrain-Livestock Study [Sharples, Miller, and L. M. Day, 1968], and similar studies in other regions.

The overseas research of agricultural economists followed the same two patterns—one eclectic and general, the other specialized both philosophically and on the discipline of economics. Studies specialized on utilitarian economics included: a Guatemala study [Fletcher, Graber, Merrill, and Thorbecke, 1970], Day's and Singh's work in India [R. H. Day and Singh, 1977], and Heady's work in Thailand [Nicol, Striplung, and Heady, eds., 1982]. Other studies were more eclectic and less specialized on maximization either for purposes of prediction or prescription; these include studies in Nigeria [Glenn L. Johnson, Scoville, Dike, and Eicher, 1969], in Korea [Rossmiller *et al.*, 1972], and in Latin America [Harrison *et al.*, 1974]. In some of these (and other) less disciplinary, more eclectic studies, substantial participatory interaction took place between decision makers and analysts so that the results reflected dialectic interaction in the process of developing and using the studies.

Domestically, there were studies dealing with problems and issues involving environmental quality [Castle, 1972; Schmid, 1972]; poverty [Bawden, 1972]; and discrimination, rural development, and community services [R. J. Hildreth and Schaller, 1972]. These studies tended to be eclectic and relatively unspecialized philosophically and with respect to disciplines in part because agricultural economists involved were often faced with the necessity of making a place for themselves on problem-solving or subject-matter teams including biophysical scientists, sociologists, engineers, political scientists, and others. Many of these studies were of a subject-matter rather than problem-solving nature. Relatively little participatory interaction with decision makers and affected people was involved. Lack of problem-solving interaction made this research less pragmatic than might be expected; in fact much of it can be characterized as multiconditionally normative as several values were often taken as given. In this connection the reader may want to refer to the section on efficiency considerations in the AAEA review article on rural development [Jansma *et al.*, 1981].

In international work, the late 1950s and early 1960s were characterized by little attention to agriculture, and where agriculture was attended to at all, the concentration was mainly on large-scale, more commercial farming possibilities in the less developed world. By the mid-1960s it finally became clear to general economists and central planners that agriculture was of fundamental importance and there was a rush to rediscover agriculture. This movement was followed a short time later by a rush on the part of agricultural economists who had been engaged in developmental work to rediscover farm management. Currently, general economists and agricultural economists who were not previously interested in farm management are working with theories of the firm which take into account firm-household relationships and the normative as well as the positive. One familiar with the balanced farming program of the University of Missouri and with the other domestic farm and home development studies and programs

of the late 1940s and the 1950s feels that he is seeing a summer rerun on television. In any event, there is a deep interest in decision-making theory at the farm level that encompasses the firm and the household and, hence, the normative, positive, and prescriptive.

Also in international work, many agricultural economists came in contact with public decision making as they served as advisers, consultants, and problem-solving researchers in the U. S. Agency for International Development (AID) and its predecessors, the International Bank for Reconstruction and Development (IBRD, the World Bank), UN Food and Agriculture Organization (FAO), Ford Foundation, Rockefeller Foundation, and other agencies, missions, and projects. These practical contacts served to stimulate interest in public decision making as part of a problem-solving process. Interest shifted from that of a detached study of decision making to a participatory interest. Some agricultural economists became interested in how to participate in making decisions rather than in merely how decisions are made. Such participation involved problem definition and solution, and hence an interest in prescriptive knowledge as it is related to positive and normative knowledge.

While some agricultural economists were participating in problem-solving activities abroad, others were having similar experiences domestically as a result of the problems and issues that upset U. S. tranquillity in the late 1960s and early 1970s. By then, it was clear that the agricultural economics profession was not dead as Gray [1970] feared; instead, many of its members were grappling with practical problems requiring philosophic underpinnings to help them work objectively with both the positive and normative in finding non-Pareto optimal prescriptions as solutions to problems. With the exhilarating experiences of participating in obviously useful problem-solving efforts came an increased interest in disciplinary and subject-matter research relevant to problem solving. Agricultural economics became, indeed, alive and well.

3. The Need to Study the Normative

As the constituencies of agricultural economists became concerned with real world problems and began to insist on practical relevance for the discipline [Glenn L. Johnson, 1971], the need to study the normative received increasing attention through expressions of dissatisfaction with price-weighted measures of gross national product, national income, and national indexes of productivity. Karl Fox [1974], among agricultural and general economists, became concerned with social indicators and produced a book in which the GNP concept was expanded to include monetary values for the nonmonetary incomes generated in the full twenty-four hours available to each person in the society. In addition to agricultural economists, many other persons became concerned with the measurement of value. Sometimes, the measures were much more specialized as

when nutritionists measure calorie consumption, protein consumption, and when engineers and others become involved in energy accounting.

Neoclassical utilitarian economics underwent a transformation during and after World War II. It was transformed to neoclassical utilitarian "market economics" as a result of the questions raised by Pareto. As Hicks [1939] and later Reder [1947] restricted neoclassical utilitarian economics to Pareto optimality, its evaluative and predictive capacity was restricted to the adjustments which take place in the market. Neoclassical utilitarian economics was changed from the *"old" Pigouvian welfare economics to the "new" Pareto optimal welfare economics.* Formal economics lost the logical structure it had used to evaluate the consequences of institutional, technological, and human changes which damage some individuals in order to benefit others. Without such a structure there was no way for economics to evaluate attempts to alleviate poverty, to restrict the activities of polluters, to redistribute rights and privileges among minority groups, or to do much to solve problems not solvable in the market place.

Positivism did not provide the answers [Pirsig, 1974]. Conditional normativism left answers to normative questions in an arbitrary state. For both positivism and conditional normativism, one set of values was as appropriate, as objective, and as true as any other set. This arbitrariness did not satisfy such pragmatists as Kenneth Parsons [1958]. Nor did it satisfy more normative persons inclined to believe that justice, equality, environmental quality, etc., really do have basic values which cannot be ignored in solving problems. Alternatives to characteristics of the real world, can be either directly or indirectly perceived. Moore was one of the major influences in John Maynard Keynes's student life [Moore, 1956, dust jacket].

C. I. Lewis dealt with the problem of converting normative and positivistic information into prescriptive statements about "how things ought to be done"—with what is right as contrasted to wrong—*vis-à-vis* both proposed and actual actions. The normativism of Moore and Lewis provides a philosophical alternative to positivism, pragmatism, and conditional normativism. Such an alternative would help solve the problem of interpersonally valid welfare measures and make Pareto optimality less necessary.

Agricultural economists, as a group, have not taken Pareto optimality seriously; they have not done so, perhaps, because they, in their common sense, know that the values of conditions, situations, and things are experienced and that terms describing these experiences can be used in logical discussions to arrive at non-Pareto optimal solutions of problems. Probably, it was a crude but inadequate recognition of this commonsense position regarding the normative that underlay the use of conditional normativism by agricultural economists during the period. Pareto optimality did not find full expression in agricultural policy textbooks until Tweeten's book was published in 1970. Clearly, agricultural

economists have been more normativistic in practice than in their methodological and philosophic pronouncements. In their methodological pronouncements they tend to be positivistic, conditionally normative and pragmatic; in practice they are more normative—along the above interpretation of the Moore-Lewis line of thought. The normativism they practice seems based more on necessity than on knowledge of normative philosophy. This reviewer, some of his students, and a few others began to take outright normativism seriously, particularly after 1965 [Glenn L. Johnson and Zerby, 1973; Glenn L. Johnson, 1976] but also before the late 1960s [Glenn L. Johnson and Zerby, 1961; Glenn L. Johnson, 1960b, 1961a, 1963b].

PRAGMATISM

This philosophy is an alternative to positivism, conditional normativism, and Pareto optimality, and has long been advocated and practiced by a substantial number of agricultural economists. As repeatedly noted before, the Wisconsin institutionalists have long held a strong interest in practical problems solvable mainly with institutional adjustments outside the market place. This interest on the part of the pragmatists and their willingness to address practical problems has made them more successful in working on *institutional* aspects of the problems of the late 1960s than the positivists, the conditional normativists, and Pareto optimalists. Unfortunately, they have not demonstrated similar competencies *vis-à-vis* nonmarket *changes in technology and people.*

The interest of the pragmatists focuses heavily on prescriptive knowledge. Hypotheses tested by pragmatists tend to be prescriptive whereas those tested by positivists tend to be positivistic. As prescriptions are functions of both the positive and normative, the pragmatic metaphysical presupposition that the positive and normative are interdependent does little direct damage to the pragmatists' problem-solving activities. Pragmatism does, however, come into conflict with the positivistic philosophies of the physical and biological scientists who are working on technological change [Glenn L. Johnson, 1977b]. It also comes into conflict with outright normativists who hold the possibility at least that there may be knowledge of the values of such things as freedom, equality, justice, etc., that are independent of the positive. Pragmatism as an alternative to positivism, conditional normativism, and Pareto optimality is somewhat limited by the metaphysical presupposition of interdependence between the normative and positive on the part of the pragmatists. The question of interpersonal validity of welfare measurements hardly arises for the pragmatists. They regard the normative and positive as interdependent in the context of the problem at hand. Prescriptive knowledge—derived from both positive and normative knowledge—is always conditioned by the problematic situation at hand.

A constructive post-World War II effort noted earlier was the development of a training program in public administration for agriculturalists at Harvard University under the leadership of John D. Black and with the assistance of John M. Gaus. This deepened the interest in *process* in agricultural economics, which meant that Black's emphasis on neoclassical utilitarianism was modified to complement and supplement the interest in process that had long characterized the Wisconsin institutionalists. This in not surprising inasmuch as both Black and Gaus were trained at Wisconsin [Gaus and Wolcott, 1940].

A QUANTIFICATION OF PRAGMATISM

A quantification of pragmatism has been taking place that has hardly been recognized. Historically pragmatists tended to be suspicious of the quantitative techniques of statisticians and econometricians probably because those techniques often treat positive knowledge as independent of normative knowledge. As the lives of O. C. Stine, Wesley Mitchell, and others attest, pragmatic institutionalists could also be leaders in developing data and in making projections as to the consequences of alternative courses of action, particularly projections emerging iteratively out of interactions between investigators and decision makers or affected persons.

In recent years, the interactive, iterative process of making projections has been viewed in somewhat more formal terms by some agricultural economists. By contrast, systems scientists (such as Jay Forrester at MIT) drawing on cyberneticists were positivistic and conceived of a system as closed if the positive feedback loops were complete. When the systems-science simulation approach has been used by agricultural economists in practical, problem-solving contexts, there have been substantial interactions and iterations between researchers and decision makers and/or affected persons [Rossmiller *et al.*, 1972]. These iterations and interactions have, in effect, closed *normative* as well as *positive* loops and are so viewed by some agricultural economists working with systems-simulation models [Glenn L. Johnson, 1977a].

Probably the most significant philosophic tendency of the mid-1970s in agricultural economics is this quantification of pragmatism, which originated in cybernetic work that, ironically, was more positivistic than pragmatic. From cybernetics and systems science came an eclectic approach developed for modeling the domains of problems. Work in cybernetics also spawned the work of the information theorists, which has had important impacts on agricultural economics *via* the joint committee of the AAEA and the American Statistical Association, chaired by James Bonnen [1975]. In practical contexts, the system scientists began to make contributions to agricultural sector analyses as well as to the modeling of subnational and private systems [Halter and Dean, 1971; Manetsch *et al.*, 1971; Rossmiller *et al.*, 1972], not to mention the global modeling efforts of the Club of

Rome reported in the book entitled *Limits to Growth* [D. Meadows *et al.*, 1972]. These models dealt with multiple criterion variables and avoided premature use of the maximization techniques of neoclassical utilitarian economics. Because such models were mainly problem-solving in nature or relevant subject-matter efforts, agricultural economic analysts using such models began to interact with decision makers and affected persons. As the approach was already iterative, the interaction converted the whole approach to a pragmatic one in which information about criterion (normative) variables and positivistic variables emerged interactively and iteratively out of the problem-solving process.

The development described above is of substantial philosophic significance. While Churchman has not been involved directly in work with agricultural economists, his writings [Churchman and Ackoff, 1950; Churchman, 1968; Mitroff and Turoff, 1973] display an understanding of the fundamental importance of what is being done by agricultural economists using the system-science simulation approach. Mitroff and Blankenship [1973] argue for a pragmatic, dialectic approach to the conceptualization of large-scale, social experiments. They consider the difference between conceptualizing well- and ill-structured systems. A well-structured system may be easily conceptualized in terms of, say, a given discipline such as physics using a positivistic philosophy or alternatively in terms of a given discipline such as ethics using a normative philosophy. An ill-structured system may involve more than one and sometimes unknown disciplines and hence may have to be conceptualized in terms of different philosophies. Conceptualizing such a system involves "defining the state of nature" of the problematic system. For conceptualizing such systems, Mitroff and Blankenship [1973, pp. 345ff.] offer the following guidelines:

> Guideline 1. AT LEAST TWO "radically distinct" disciplines of knowledge must be brought to bear on the conceptualization of any potential holistic experiment.
> Guideline 2. AT LEAST TWO "radically distinct" kinds of conceptualizers (personality types) must be brought to bear on the conceptualization of any potential holistic experiment.
> Guideline 3. AT LEAST TWO "radically distinct" philosophical inquiry models (conceptualizations) must be brought to bear.
> Guideline 4. The subjects (general populace) of any potential holistic experiment must be included within the class of experimenters; the professional experimenters must become part of the system on which they are experimenting—in effect the experimenters must become the subjects of their own experiments.
> Guideline 4′. The reactions of the subjects to the experiment and to the experimenters (and vice versa) are part of the experiment and as such must be swept into its design (i.e., conceptualization).

Guideline 5. The epistemic design rule for resolving the disparity between conflicting conceptualizations is CONFLICT—NOT "agreement" or "consensus."

Guideline 6. The methodological (i. e., philosophical inquiry) system for handling conflict is that of a Dialectical Inquirer.

Guideline 7. An appropriate design tool for modeling any conceptualization is simulation but—IF AND ONLY IF—it includes LIVE HUMAN PLAYERS chosen in accordance with all the previous guidelines.

Note the dialectic, pragmatic, eclectic, interactive, and iterative nature of these guidelines. Mitroff's pragmatic connection is *via* Singer rather than Dewey who was the source for Commons's institutionalism.

When agricultural economists followed such guidelines in developing a computerized model of the Korean agricultural sector, they in effect quantified pragmatism [Rossmiller *et al.*, 1972]. The iterations and the interactions with decision makers and affected persons provided an important source of normative and positive information which may be interdependent. This, and the postponement of maximization until the preconditions for carrying out maximization are met, make the practicing agricultural economists and systems scientists such as Mitroff and Blankenship essentially pragmatic in their approach and in the philosophy.

4. Individualism, Liberalism, Existentialism, Reactionaryism, and Processes

So far, this review has implied that agricultural economists have been only vaguely aware of the role such conflicting philosophies as pragmatism, positivism, outright normativism, and conditional normativism have played in guiding their thinking and activities since World War II. Awareness levels with respect to the topics of this subsection—individualism, liberalism, authoritarianism, existentialism, and reactionaryism—were even lower; hence, it is even harder to discern consistent patterns in the literature, thinking, and activities of agricultural economists from the end of World War II through the mid-1970s.

The neoclassical utilitarian tradition placed heavy emphasis on individualism. This emphasis was reinforced to a certain extent by the new welfare economics that tended to leave individuals and the *status quo* in a somewhat more dominant position by refusing to grant interpersonal validity to welfare measurements. As part of this rather illogical tendency, however, we find modern welfare economics also used illogically to defend the *status quo* instead of recognizing that it cannot be used either to defend or attack the *status quo*. It has become fashionable for younger agricultural economists to argue that older agricultural economists spent the 1930s, 1940s, 1950s, and 1960s defending the *status quo*. Such arguments re-

flect an ignorance of history and perhaps failure to recognize that many who are well off today were the disadvantaged of former years who were helped at that time with subsidized credit, public education, new technology, social security transfers, disaster relief, resettlement schemes, public irrigation, and drainage projects.

The 1946-76 period started out with a liberal rejection of the authoritarianism of the right and with military victories over the totalitarian rightist powers of Germany, Italy, and Japan. Paradoxically, the period later included a so-called liberalism that viewed sympathetically the authoritarianism of the left, both abroad and domestically! In fact, it has been difficult, at times, to distinguish a *liberalism* that would impose drastic damages on some individuals in order to confer rights and privileges on others from *authoritarianism*. During the period, the word liberal became almost meaningless—sometimes it stood for preserving the rights of individuals while at other times it stood for efforts to redistribute rights and privileges from some individuals to other individuals in such ways that the individuality of the losers (and even the gainers) would be greatly impaired, the central city welfare programs being important cases in point. In general, central city welfare recipients have been granted little control over programs designed to help them. As a consequence, their individualities have been diminished as they have had to deal with paid welfare workers. By contrast the subsidized production credit, land bank, and soil conservation associations, the 4H clubs, and the county extension service programs were placed under local control in ways which preserved local pride and individual identities. Many of the radical "New Left," who are not so new anymore, reject both the traditional and the current liberalism as protecting the rights and privileges of the "haves" [Zerby, 1971].

During the postwar period, a few agricultural economists became interested in existentialism. Existentialism is based on the conviction that knowledge of one's existence is the most empirically based knowledge one has. It also assigns high value to establishment and maintenance of one's existence or "identity"—individualism is important!

The pragmatic educational philosophy encountered by extension workers and vocational agricultural workers in their training is reinforced by Wisconsin institutionalism in agricultural economics. In the 1950-76 period, agricultural economists working abroad learned again and again the existentialist importance of the individual and of working interactively with individuals so as to develop, not constrain, their personal identities.

Many of the above "isms" are concerned with processes both in historical and current contexts. The concern is often normative and prescriptive, i.e., with whether "things are working out well." There is an extended concern with history, with processes, and with control over the processes that partially determine destinies and, hence, future history.

5. Marxism

In the 1960s and early 1970s, one could observe in agricultural economics circles a renewed interest in the teaching and philosophy of Marx although that interest has not become as widespread or popular in the United States as in France, for example. This interest was strengthened by the meeting of the International Association of Agricultural Economists in Minsk in 1970 and by the activities of leftist groups both outside of economics and within the American Economic Association. Kuhn's book—perhaps because of its title, *The Structure of Scientific Revolutions* [1970]—attracted some attention among agricultural economists. When a major change takes place in the questions to which a scientific discipline addresses itself, it becomes ill-structured and its laws, theories, models, and data have to be changed to re-establish its structure. Kuhn regards such major changes as a revolutionary change in "paradigm." It is now a fad to use the word paradigm (both with and without prior consultation of a dictionary) to upgrade even minor changes in thought to the status of *revolutionary paradigmatic shifts*, which Kuhn would probably call "improvements for puzzle solving" rather than (revolutionary) paradigmatic shifts! Some of the so-called New Left have asserted that the questions raised for economics by the social unrest of the late 1960s require abandonment of what they call the neoclassical paradigm and use of a Marxist paradigm based on the classical labor theory of value, social ownership of the means of production, the perfectibility of man, and so on.

The range of problems and subjects researched by agricultural economists in both foreign and domestic locations seems to have become too complex to be handled by a single, large paradigmatic change going (retrogressing?) from neoclassical and post-neoclassical utilitarian economics to the pre-neoclassical labor theory of value in Marxism. The labor theory of value seems too simplistic to deal with: the values of individualism; equity in the distribution of market, political, military and police power; imperfections in human beings. Instead, numerous, smaller, more adaptive, hardly revolutionary changes are required when proceeding from problem to problem and subject to subject relative to changing issues. To this reviewer, the assertions of the antique labor theory of value seem to cry out for objective normative research (both analytic and synthetic) rather than dogmatic adherence. One is reminded of Parsons's fears of reversion to medieval dogma and the assured ends of conduct [K. H. Parsons, 1958]. Unfortunately, positivists and conditional normativists are in weak positions to complain about arbitrary unobjective endorsement of values (right, left, center, or otherwise), for they insist that *all* normative concepts are arbitrary and unobjective. In fact, and as Parsons feared, it is their refusal to grant the possibility of objective normative research that opens the way to capricious use of arbitrary values (right, left, and otherwise) including adherence to such "religious-like" values as those

of conservationism, agricultural fundamentalism, central city fundamentalism, environmentalism, energy fundamentalism, and consumerism.

The New Left has also advocated dialectics as opposed to analytics. Methodologically, Carnap [1953] and Popper [1962, 1972] have stressed: the relationship between analytic and synthetic knowledge; the tentative, questionable (dialectical) nature of all synthetic knowledge based on primitive terms (as subjective interpretations of sense impression); and the dependence of purely analytic or logical truth on axioms bearing no known relationship to reality. Thus, as empirical scientific truth is always subject to question and challenge, modern science is dialectic. To put one's knowledge above the tests of logic and experience—i.e., above question—is to sin in the eyes of the scientific community. Georgescu-Roegen [1971] argues that even physics is normative (at least in the pragmatic sense) [Glenn L. Johnson, 1973, pp. 492ff.] and dialectic. Modern science has no important disagreement with Marxism on dialectics though some Marxists attack modern science as nondialectic.

6. The International Association of Agricultural Economists

The proceedings of the triennial meetings of the International Association of Agricultural Economists reflect the work of agricultural economists, albeit belatedly, and in turn affect their work. The first postwar IAAE conference, held in Dartington Hall in 1947, served to re-establish the Association after the World War II interruption. Subsequent meetings at Stressa in 1949, East Lansing in 1952 and Helsinki in 1955 helped to reunite the agricultural economists of the world. An important accomplishment of the first four meetings was reunification and re-establishment of dialogue between the agricultural economists of the Allied and Axis powers. Important also was the participation of agricultural economists from Eastern bloc (including persons from the People's Republic of China) and less developed countries. By the time of the Helsinki meetings, communications among the agricultural economists in the different countries was being extended from older, well-established persons to include the younger group of post-World War II agricultural economists.

From the Helsinki meetings in 1955 to the 1970 meetings in Minsk, there was a steady, slow growth in the influence of IAAE but not a great deal of change in the discussions at meetings of *philosophies, research approaches, or techniques*. The Association had been influenced early by Cornell empiricism as had English agricultural economics. That influence persisted in the International Association after World War II until younger economists began to play a more important role. Despite this emphasis, the Association meetings were eclectic, moderately multidisciplinary, and, above all, concerned with the lives and welfare of rural people. Leonard Elmhirst, the founding father, was as much a rural sociologist as an agricultural economist and was keenly aware of technology and the human

element. Although the Association was oriented to rural people, not farmers alone, the problems of farmers were always high priority.

Particularly at the 1967 meeting in Sydney and again at the 1970 meeting in Minsk, but also earlier at Helsinki, Cuernavaca, and Dijon, younger members of the Association voiced demands for greater attention to economic theory and modern quantitative techniques—in short, for more disciplinary excellence. There was also a demand for greater participation on the part of younger persons. The demand was forcefully expressed at the Minsk meeting by John Dillon, who expressed disappointment that he did not have an opportunity to hear more from competent, young Soviet theorists and statisticians. This demand for greater disciplinary excellence and for wider participation was reflected in the contributed paper sections at the 1973 São Paulo meetings and particularly at the Nairobi meeting in 1976.

Although the Nairobi conference remained eclectic and multidisciplinary, it did give considerable attention to disciplinary excellence with respect to dynamics—particularly that part of dynamics dealing with decision making (both public and private). The decision-making theories discussed dealt with the normative and prescriptive as well as the positive information-gathering and -processing activities of decision makers. Prior to the Nairobi meeting there was a conference on risk and uncertainty sponsored by the ADC at CIMMYT. In contrast to the Nairobi meeting, the CIMMYT meeting dealt largely with risk aversion and preference and the expected utility hypothesis, particularly as handled by Arrow [1971], Hull *et al.* [1973], and Dillon and Anderson [1971]. The Nairobi approach was broader and dealt with the learning, execution, and responsibility phases of management as well as with decision making and the mathematical niceties of the expected utility hypothesis. Thus, the Nairobi meeting explicitly involved normative philosophies and pragmatism to a much greater extent than the CIMMYT meeting.

Chapter IV. The Ending Inventory

By the mid-1970s, the philosophic orientations of agricultural economists had changed substantially from those held at the beginning of the post-Word War II period. Their mid-1970s positions will be discussed under the following headings: positivism, neoclassical utilitarian economics, the residual impacts of the late 1960s, normativism, normativistic and/or positivistic subject-matter research, prescription, the meaning of truth in economics, and the emerging quantification of pragmatism.

1. Positivism

By the mid-1970s positivism was probably stronger in agricultural economics

than in the late 1940s; however, the positivism of the mid-1970s was much different from that of the early 1940s. In the 1940s, for instance, much of the positivism in agricultural economics was found in farm management; of that in farm management, much was nearer to pure positivism or pure empiricism than logical positivism. Since the late 1940s, agricultural economists and, particularly, econometrically inclined agricultural economists have paralleled the development in the physical sciences summarized by Carnap [1953]. The econometricians, like the physical scientists, combined the work of logicians and theorists with that of economic empiricists and clarified the relationships among the logical (or analytic), primitive terms, and the empirical (synthetic). In the hard sciences, important logicians were Leibniz and Descartes and important empiricists were Bacon and Locke [Mitroff and Turoff, 1973]. Modern science put the logical together with primitive terms to form the synthetic or empirical in the manner described by Carnap. Similarly, the econometricians put the theories of economics, statistics, and mathematics together with the empirical work of economists to form econometrics, also in the manner detailed by Carnap. The result is a form of positivism known as *logical* positivism rather than the "*pure*" or "*straight*" positivism of the traditional farm managers of the 1930s and early 1940s. Mini [1974] in his book on philosophy and economics seems unaware of this development in either general or agricultural economics and pleads for its occurrence.

One current anomaly is that the positivistic work of econometricians and of such positivistic economists as Friedman deals with price, income, expenditures, gross national product, and other variables that are normative in the sense that they measure monetary *values*. Perhaps because these normative variables are so quantifiable, they are not regarded as normative!

Positivistic econometric techniques have been greatly improved and were at a much higher state of development by the mid-1970s than in the late 1940s. Techniques important here involved programming with all of its modifications and variations, the estimation of parameters of simultaneous equations, input/output analysis, benefit/cost ratios, and so on.

Two strong pieces of evidence of the continued strength of positivism among agricultural economists are the use of conditional normativism and Pareto optimality. Conditional normativism à la Myrdal was commonly practiced in the late 1940s and early 1950s and is probably no less commonly practiced now than then. Pareto optimality, which is intellectually related to positivism, had very little impact on agricultural economics for much of the post-World War II period but is now more widely but not universally used among agricultural economists. Our review of what went on in the period between World War II and the mid-1970s indicates that policy analysts among agricultural economists were particularly slow in moving to Pareto optimality. Fortunately (in the mind of this reviewer) that slowness delayed the impact of positivism on agricultural policy analysis.

Another avenue whereby positivism may have strengthened its grip on agricultural economics is *via* cybernetics with its concern about information systems and data processing. Further evidence of the impact of positivism on agricultural economics is the current tendency to regard production functions as positive even though many of the older members of the agricultural economics profession learned, early in their careers, that production was "the creation of time, form, and place *utility*."

Positivism, despite the sharp criticism it has received at the hands of philosophers and many others, is not dead in agricultural economics by any means. In fact it may be peaking some thirty years after the date Kaplan [1968] gave as the beginning of the end for positivism—the end of World War II.

Agricultural economists in their work as disciplinarians have made substantial progress under positivistic influences. Ironically, some of this progress has been based on the methods of positivism in working with such normative variables as production, prices, incomes, expenditures, indexes of output, and indexes of input. Also positivistic methods have been productive when employed by economists doing subject-matter research. It will be recalled that subject-matter research was defined earlier as the accumulation of a set of multidisciplinary information (multidisciplinary because it would be disciplinary if only one discipline were involved) useful in solving a *defined set* of problems but not adequate to solve any *one* of the problems completely. When the defined set of information in a subject-matter research effort is positivistic or largely positivistic, positivism with its highly effective associated methodologies has much to contribute. It is in the realm of problem-solving research that the weaknesses of positivism are revealed—for instance, its inability to work objectively with the normative. This inability means that positivistically inclined workers have difficulty both in defining problems and in determining "what ought to be done" as a prescription to solve a particular practical problem.

2. Neoclassical Utilitarian Economics

Utilitarian economics is, of course, normative and prescriptive. However, utilitarianism is so specialized to economics that it is commonly considered separately from other more general forms of normativism (to be discussed in a subsequent subsection).

Neoclassical utilitarian economics has strengthened its philosophic grip on agricultural economists and is now in a stronger position than at the end of World War II. However, the utilitarianism of agricultural economists, like their positivism, changed significantly between the beginning and ending inventory. The change can be described as a change from "neoclassical economics" to "neoclassical *market* economics."

The change resulted from Pareto's questions introduced into economics by Hicks in his *Value and Capital* [1939]. As neoclassical utilitarian economics came under the influence of the Hicks questions, the evaluative and prescriptive power of neoclassical utilitarian economics was increasingly restricted to Pareto optimal adjustments that, of course, are attainable in a market; by contrast, nonmarket adjustments that are executed by the government and that are not Pareto optimal can no longer be evaluated [Reder, 1947]. Thus, much of the neoclassical utilitarian economics that existed and was used by agricultural economists in the mid-1970s was weaker than the neoclassical utilitarian economics being practiced by agricultural economists at the end of World War II. Fortunately neoclassical utilitarian economics, even though weakened by Pareto optimality, can be (and still is) used to predict the consequences of nonmarket adjustments. However, it withholds evaluative judgments and refuses to make welfare statements concerning nonmarket adjustments that damage some in order to benefit others. This, of course, had been recognized in the theory of second best [Lipsey and Lancaster, 1956]. Econometricians, operations researchers, and others employing Pareto optimal, neoclassical, utilitarian economics can thus predict the consequences of nonmarket adjustments but cannot evaluate them.

Another consequence of Pareto optimality is inability to compare production aggregates involving more than one person when they result from nonmarket (coerced) changes in technology, people, and institutions. This weakening of neoclassical utilitarian economics by Pareto optimality is, of course, a valid explanation of the inability of post-Pareto neoclassical economics to respond constructively and effectively to the crises of the late 1960s. It is not a bias of Pareto optimality in favor of the *status quo* that does the damage; instead, it is impotence for handling redistributive problems. Student activists seemed to have sensed this more acutely than did disciplinary economists!

3. Residual Impacts of the Late 1960s

The problems and issues of the late 1960s have left their impact on the philosophic orientation of agricultural economics. There has been an increased demand for relevance on the part of students, research clientele, and the public in general. This has shown up in demands for greater accountability on the part of research organizations.

The upshot of these demands has been an increased awareness of the inadequacy of Pareto optimality as a basis for welfare decisions concerning nonmarket changes in technology, institutions, and people. Early in the crisis years of the late 1960s, there was a tendency to turn to rather arbitrary, superficially defined values. It was not long, however, before the results of this procedure ran into conflicts with both logic and experience. This led to a deeper search in logic and experience for normative knowledge.

As part of the uneasiness with neoclassical market or Pareto optimal economics, some of the younger agricultural economists developed a substantial interest in Marxism and in the labor theory of value. There is some evidence that these younger economists now see the "antique" nature of the labor theory of value in the history of economic thought. They have also encountered logical conflicts among the labor theory of value, the Marxist assumption that man is perfectible, and the severe force by elitist Marxist regimes to bring "imperfect men" from the masses into line with the objectives of small party elites. Marxism has, perhaps, been more prevalent among French agricultural economists than among any other national group outside the Communist bloc nations. This may be why penetrating thinking in France concerning Marxism seems to focus increasingly on the conflicts noted above. In terms of G. E. Moore [1903], the Marxist adherence to the labor theory of value amounts to a naturalistic fallacy, i. e., the fallacy of stating that that which possesses the characteristic of goodness, in this case laboring, is goodness. One might hypothesize that economists and agricultural economists reflecting logically on their own normative experiences might see increasingly that the labor theory of value is an inadequate source of knowledge about the value of racial justice, individual freedom, environmental quality, minority rights, civil rights, and so on.

The residual impact of having to respond to the crises of the late 1960s is a demand for more objective, less arbitrary research on values. This demand can be met with an outright normativism that can view good and bad as knowable independently of positivistic knowledge, and a pragmatism that views the normative and positive as interdependent in the context of a problem and expressible mainly in the form of prescriptions to solve that particular problem.

4. Normativism

As noted above, there has been a strengthening interest in outright normativism since the crises of the late 1960s. Before concluding, however, that normativism is in a stronger position than in the immediate postwar period, it must be remembered that neoclassical utilitarian economics has been substantially weakened by the Pareto optimality restriction. Then, too, conditional normativism is at least as strong as it was in the immediate post-World War II period. Probably the position of that particular form of normativism labeled "neoclassical utilitarian economics" is weakest among the most disciplinary of the agricultural economists as they tend to be positivistic. Pareto optimality has been followed less consistently by agricultural than by general economists. And among agricultural economists, Pareto optimality has been ignored more consistently by agricultural economists doing problem-solving and subject-matter research than by those with disciplinary interests and concern for peer group approval, tenure, and "refereed" publications; ironically, those individuals with these latter concerns in-

clude some of the young people who stressed the normative aspects of the problems and issues in the late 1960s.

Operationally, a substantial amount of normativism exists among agricultural economists who make their living measuring and analyzing income, prices, expenditures, the contribution of agriculture to GNP, and other factors. Such work is fundamentally normative even though it is confined to monetary as opposed to nonmonetary values. Many agricultural economists also specialize in estimating exchange values not provided satisfactorily by the market as when they compute opportunity costs and shadow prices. We note, of course, that the interest of economists in prices is an interest in values in exchange. Much less attention is paid to total or intrinsic value as opposed to exchange values by agricultural economists [Black, 1953a]. Agricultural economists also make extensive use of the normative concepts of consumer and producer surpluses. Although some would initially deny it, agricultural economists also deal with the normative when they deal with production—the creation of time, form, and place *utility*.

In employing benefit/cost techniques, agricultural economists often become involved in estimating nonmonetary values in order to obtain a common denominator in terms of which to express benefits and costs as a ratio. Such work is more than conditionally normative because it requires the economist to establish the value of one condition, situation, or thing in terms of other conditions, situations, or things. When used to evaluate nonmarket adjustments, benefit/cost ratios also imply interpersonal comparability.

Then, too, agricultural economists have become involved in the social indicators movement, a prominent example being the work of Karl Fox [1974]. Again, outright normative work is being done when attempts are made either to estimate nonmonetary values or to find a common denominator (*numeraire*) other than money among various values. Agricultural economists have also been involved in such social indicators as those used in energy accounting, measurement of nutritional status, levels of living, and environmental quality. Fortunately, the role of agricultural economists in the latter connection has often been that of critics.

Outright normative work tends to be either disciplinary or subject matter in nature. The fact that outright normative work is ordinarily disciplinary or subject matter in nature does not indicate that such work was irrelevant in responding to the crises of the late 1960s. We must recognize, however, that problems are not solved with normative information alone, any more than with positive information alone. We reach prescriptive knowledge—knowledge about what ought to be done—on the basis of both positive and normative knowledge.

5. Pragmatism

This philosophy is in a stronger position in agricultural economics in the mid-

1970s than in the late 1950s and 1960s and it continues to be a major alternative to positivism. Its greater recent strength grows in part out of recognition that an alternative to positivism is essential in designing non-market-induced changes in institutions, technologies, and people to handle issues and solve problems and, in part, out of the increased generality of quantitative methods that permit quantification of pragmatism, so that we begin now to have computational capacity to match and handle the complexity of pragmatic methodologies.

6. Normativism and Positivism in Subject-Matter Research

When agricultural economists conduct research in such subjects as energy, employment generation, and food and nutrition, they often deal with positive and/or normative information and, in the case of the latter, with both monetary and nonmonetary values. Positivistic or conditionally normative subject-matter researchers tend to confine themselves to the positive with and without normative assumptions. Many such positivistic and conditionally normative workers regard monetary values as positivistic probably because such values are readily quantifiable.

7. Prescriptive Research

Economics and agricultural economics in particular are decision-making disciplines. They are concerned with prescribing "what ought or ought not to be done." They also evaluate "what ought or ought not to be done" in terms of whether what was done was a justifiable prescription. Also, economists, along with engineers, architects, physicians, and others, often go into the "design mode" to conceive of new institutional arrangements, technological advances, and changes in human behavior to solve a problem. Further, agricultural economists often assume that producers, consumers, and resource owners are maximizers in the neoclassical utilitarian sense and use the results of computations based on that assumption in predicting the behavior of consumers, producers, and resource owners.

We have already seen that the use of neoclassical utilitarian economics for evaluative purposes was weakened by Pareto optimality. In this paper, I have labeled this weaker form of neoclassical utilitarian economics neoclassical "market" utilitarian economics. The use of conditionally normative techniques has also reduced the evaluative power of agricultural economics. Nonetheless, agricultural economists have gone beyond such market economics and Pareto optimality to evaluate and prescribe changes made outside the market in institutions, technology, and people [Libby, 1971; Randall, 1972; Dorner, 1971].

Some of these prescriptions are arrived at with the methods implied by pragmatism. Others are arrived at under the presupposition that both normative and positive information are independently attainable but jointly processible *via* a de-

cision rule into prescriptions as to what ought to be done or evaluations as to what ought or ought not to have been done.

In general, there has been a strengthening of pragmatism and it is in a stronger position in the agricultural economics of the mid-1970s than at most any other time since World War II [Boulding, 1969].

8. The Meaning of Truth in Economics

With apologies to Frank Knight, who used a similar title in writing an important review of pronouncements by Hutchinson *vis-à-vis* positivism [Knight, 1940], we proceed at this point to review the meaning of truth for agricultural economists as of the mid-1970s.

As indicated in the early pages of this review, there are at least four tests for truth employed by researchers and the public in general. Not all agricultural economists apply all of these tests [Glenn L. Johnson and Zerby, 1973]. *One* test is that of logical consistency (referred to as *coherence* by philosophers and internal consistency by some agricultural economists, including this reviewer earlier). A *second* is the test of *correspondence* (referred to by some agricultural economists, including this reviewer earlier, as external consistency). A *third* is the test of *clarity* or lack of ambiguity, which must be met before either the correspondence or coherence tests can be applied and is closely related to Popper's concept of falsifiability. The *fourth* is the test of *workability*. Some analysts treat models and equations that pass the coherence test as *validated* and those that pass the correspondence test as *verified*.

Use of these four tests makes truth social, as Knight [1940] pointed out. *This social nature of truth* has also been stressed by Georgescu-Roegen in his work on entrophy [1971] and by Popper [1959; 1962, ch. 10, sec. 3; 1972, ch. 2, sec. 8-11] in his related concept of "verisimilitude." That which we accept as true is that which has not yet flunked one or more of the above tests. As our empirical knowledge changes, the new concepts may be inconsistent with other previously accepted concepts. Accepted knowledge (thesis) is always to be confronted with its denial (antithesis); hence, truth is the result of a dialectic process and attempts to dichotomize science and dialectics are probably false. Similarly, when we change reality as a result of previous problem-solving efforts and decisions, concepts that previously passed the test of correspondence may no longer pass it. Also, as our ability to conceptualize and measure increases, previously acceptable descriptive information may flunk the test of correspondence. Additionally, what is clear at one point in a society's development may not be clear at a later point. Science, itself, is a social phenomenon, and hence scientific truth is a function of the state of science as a social activity. Two papers presented at the 1977 AAEA meetings in San Diego dealt significantly with the normative [Hartman, 1977; Moles, 1977]. While these papers may become part of the phantom literature of

the 1970s, they should be noted here. Both stress that knowledge, including scientific knowledge, is social and cultural. Both papers identify science with positivism and scientific knowledge with positivistic knowledge. Modern economics is then identified as scientific and, hence, positivistic; unfortunately this then causes both Hartman and Moles to conclude that neither economics nor science can deal with "quality"—i. e., with value—although Moles is less definite on this conclusion. If positivism were identified not as *the* philosophy of science but rather as *a* philosophy of science, *science* would come off better. As institutional economics, welfare economics, and indeed neoclassical economics are normative as well as positive, the Hartman and Moles papers do seem to involve some *non sequiturs* even though they are basically correct about the need for agricultural economics to go beyond the positive (scientific in their view) to the normative. Also Hartman's paper has the distinct merit of recognizing empirical normative knowledge based on experience. They do not discuss dialectics and ill-structured systems [Mitroff and Blankenship, 1973; Runes, ed., 1960, pp. 77-78].

The social nature of truth means that truth is arrived at through a process and that this process involves successive iterations. Truth is arrived at iteratively and interactively as societies of investigators, decision makers, and affected people interact. Iteration and interaction are important with respect to the normative positive as well as the prescriptive. The process is also dialectic as truth is always opposed or being subjected to one of these tests. The oft-discussed dichotomy between science and dialectics seems to be unsustainable. The dichotomy between science and dialectics fails on two counts: (1) positivism, which in its earlier form was less dialectic than now, has never been *the* only philosophy of science; and (2) dialectics is quite characteristic of most modern thought in the sciences and in thought about the philosophic foundations of science. Popper [1959] has stressed the importance of falsifiability in science—the more falsifiable a concept, the more testable it is and the more reliable it is if it survives testing. It is desirable that concepts be confrontable dialectically with their opposites. Similarly, pragmatism and John Dewey's scientific pragmatism have always been dialectic. We should note, in passing, that some feel that the dichotomy between science and dialectics is one between analytics and dialectics; this cannot be, as modern science is both analytic and dialectic [Carnap, 1953]. Much more fundamentally, however, physics, chemistry, biochemistry, and biology are changing so rapidly that their dialectic nature would force science to be dialectic even if it were not already so. The second law of thermodynamics, according to Georgescu-Roegen [1971], requires that physics be dialectic—low-level entrophy is valuable and differences in the value of different kinds and levels of entrophy determine the variables we consider as well as the classes into which we divide these variables in physics. In turn, penumbra develop between variables and classes. Tensions then develop as alternative variables and classification schemes confront

each other dialectically in the development of a discipline such as physics. When the conceptual structure of a discipline becomes obsolete for its purposes, new conceptual structures emerge as paradigmatic changes [Kuhn, 1970] to confront existing structures in a revolutionary, dialectic manner. Science is part of culture—as such it changes—and tensions build as alternative formulations develop to confront their predecessors. If science were not dialectic, it would have to become so. Agricultural economists are well advised not to defend either their science or their analyses against dialectics.

In terms employed by Mitroff and Blankenship [1973], Kuhn's paradigmatic revolutions involve ill-structured systems that must be studied dialectically. Well-structured systems within disciplines are less dialectic—for these nondialectic methods may do well—for the time being. It is the routine well-structured systems which the "hewers of wood" handle well in a discipline. In agricultural economics, for instance, such workers do their linear programming, Cobb-Douglas, input/output, operations research, and program evaluation and review technique (PERT) analyses until, as T. W. Schultz commented, "the *AJAE* runneth over."

Chapter V. In Conclusion

Karl Brandt [1955, p. 806] concluded his 1955 presidential address with the following words:

> Agricultural economics will gain in stature and influence if, as one of the disciplines in the realm of humanities, it sets its sights high and keeps aware of the fact that its subject is concerned with cause and effect relations in human and social actions, and that this involves far more than material needs. Let us suppose that we have a generation without a major war ahead of us, and that the imagination, energy, and drive of the nations can to a large extent be allocated to and absorbed by efforts toward accelerated economic development. The changes brought about in the economic and social spheres will be breathtaking, and call for bold perception of the macroeconomic problems. The actual pace of economic progress may overtake the economic profession just as the stalling of investment, exchange, and employment caught it unprepared in the great depression. In such a period of economic growth as may lie ahead, problems of maladjustment may become even more severe, but their nature will be dynamic—such as disparity in place of development—and their susceptibility to remedial action will be greater. All this argues for more alertness in our profession to the strategy to be

> employed in allocating our human research resources, a firmed understanding of the economic order as a whole, and strengthening of the will to create theory, or, as I prefer to say: to complement analysis by synthesis.

Brandt's projection of breathtaking changes in economic and social spheres and the overtaking of the economics profession by economic progress has certainly been fulfilled. The period of growth and relative peace that followed his address did indeed create problems and maladjustments—and they were severe. There have been unfulfilled demands for a firmer "understanding of the economic order as a whole," for "theory . . . and to complement analysis by synthesis."

In a preceding paragraph, however, Professor Brandt [1955, p. 806] noted, "If it should be a sound endeavor to orient economics more towards theory, I doubt that concentration on methodology will help. While it has been much stressed in the past that any science worthy of its name must be concerned with methodology, it also seems possible that the preoccupation with methodology may be a sign of science's decay." Our review of the years since World War II has indicated that responding to the crises of the late 1960s challenged not only our methods but also the underlying philosophies that structure them. Even Brandt probably failed to envision the severity of the problems that were to appear in the late 1960s. Had he realized their seriousness, I believe he would have seen that they would challenge our underlying philosophies—yes, even his positivistic philosophy of science—to such an extent that we would have to consider methods beyond the normal tool kits of agricultural economists in the mid-1950s. Another sentence from Karl Brandt [1955, p. 806] indicates that he may have glimpsed this need: "More exchange of thought with general economists and discourse on problems of economic development with researchers in other disciplines such as philosophy, logic, philosophy of law, jurisprudence, political science, economics, history, and anthropology will not only widen horizons but give by analogy or transposition a firmer grasp of what economics is and what it cannot be." Then skipping a sentence we find: "To establish this contact with other disciplines a deliberate effort towards orientation may be made and our Association could be the catalyst." The intervening sentence read as follows: "It [economics] cannot be the arbiter of values for society and it cannot decide what ought to be done." If that sentence means that we cannot research values and contribute the results, it does not have a basis in either logic or experience—instead, it is a metaphysical presupposition of positivism which is not accepted by pragmatists and normativists. Clearly, the experiences from World War II to 1967 do not confirm this last quoted sentence from Brandt. Brandt's own positivism was itself a casualty of the late 1960s. This is not surprising, for Kaplan noted [1968] that the end of World War II was the beginning of the end (for the dominance) of positivism. Pragmatists and normativists do have much needed philosophic and, hence,

methodological contributions to make to agricultural economics in the years ahead.

We can look forward to continued philosophic reorientation and, hence, continual restructuring of our research methods. This reorientation should broaden our capacity to do disciplinary research by strengthening our ability to work with the normative while not diminishing the capacity we have acquired from the positivists to work with the positive. Similarly it should add a normative dimension to our subject-matter research without loss of its positive dimensions. *Vis-à-vis* problem-solving research, it can be anticipated that the presently perceived dichotomy between science (largely positivistic) and dialectics will be seen to be false. The same will probably be seen with respect to the supposed dichotomy between science and the humanities. Along with this realization is likely to come an eclecticism. When the forces of change cause us to perceive serious structural flaws [Mitroff and Blankenship, 1973] in our discipline, dialectics and eclecticism are likely to lead to appropriate changes in our discipline's paradigms [Kuhn, 1970]. With respect to problem solving, this eclecticism and dialectism will help us convert ill-structured definitions of problems into better-structured ones. Such better-structured problem definitions will help us to recognize more clearly the unique multidisciplinary dimensions of each problem and the unique appropriate mix of philosophic orientations and research methods to use in solving each specific problem.

Notes

1. These references are in the hands of only a few individuals. One set is available in the offices of the Farm Foundation, Oak Brook, Ill.

2. Part of the "phantom literature."

3. For additional discussion of agricultural information systems, see the following AAEA literature reviews in volume 2 [Judge *et al.*, eds., 1977]: Bonnen [1977]; Bryant [1977]; Trelogan *et al.* [1977]; and Upchurch [1977].

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