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SOCIAL SCIENCE KNOWLEDGE AND INSTITUTIONAL CHANGE*

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Over the last several decades agricultural economists have made major contributions to our understanding of the impact of advances in natural science knowledge on technical change and of the impact of technical change on economic growth. We have also significantly advanced our understanding of the sources of demand for and supply of technical change. Work carried out within the framework of the induced technical change paradigm has demonstrated that technical change can be treated as largely endogenous to the development process (Hayami and Ruttan, 1971; Binswanger and Ruttan, 1978).

We have made less progress in our attempts to understand the contributions of advances in social science knowledge to institutional innovation or of the contribution of institutional innovation to economic, political, or social change. And our knowledge of the sources of demand for and supply of institutional change remains rudimentary.

In this paper I suggest an approach to thinking about the sources of demand and supply for institutional change. I then proceed to explore the use of social science knowledge, and the role of social scientists, in the

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design and evolution of institutional innovations. Finally, I examine the contribution of agricultural economics research and of agricultural economists to the design and evaluation of two major institutional innovations--the farm credit system and the "direct payment" approach to farm price and income policy.

In my presentation I will follow the lead of both Commons and Knight and define institution to include both the behavioral rules that govern patterns of relationships and action as well as decision-making units such as government bureaus, firms, and families (Knight, p. 51). The term institutional change will at times be used to refer to both institutional innovation and to changes in institutional performance.[1/]

Institutional Innovation and the Demand for Social Science Knowledge [2]

Over the last several decades, agricultural economists and other social scientists have provided research managers with increasingly powerful tools for valuing the results of applied research in the biological and physical sciences. We are generally familiar with the calculations showing rates of return on investments in agricultural research ranging upward from 30 to 100 percent or more (Ruttan, 1982, pp. 241-249). The basic concept on which the evaluation of the returns to agricultural production research rests is that the demand for knowledge is derived from the demand for technical change in commodity production. Once the output of research was clearly conceptualized as an input into the process of technical change in commodity production, processing, and distribution, this link made it possible to develop models to measure the ex post returns to research. It then became possible to make ex ante estimates of the relative contribution of alternative uses of research resources and to attempt to begin to specify rules that research managers might follow in the allocation of research resources.

The same effort has not yet been devoted to the development of formal methodologies for the valuation of economic (and social science) research. Social scientists have only begun, perhaps somewhat reluctantly, to conceptualize adequately the contribution of knowledge in the social sciences (Stigler, 1982, p. 60).[3] The first step in an attempt to value new knowledge in economics and in the social sciences generally is to specify the sources of demand for that knowledge. It is clear that the demand for knowledge in economics is not derived primarily from either private or public demand for technical change in commodity production. The demand for knowledge in economics and in the other social sciences--as well as in related professions such as law,

business, and social service--is derived primarily from a demand for institutional change. Stated another way, changes in the demand for knowledge in economics are primarily a function of changes in demand for institutional innovation and for efficiency in institutional performance.

Shifts in the demand for institutional innovation or improvements in institutional performance may arise from a wide variety of sources. The Marxian tradition has emphasized the importance of technical change as a source of demand for institutional change. Douglass North and Robert Thomas (1970; 1973) attempted to explain the economic growth of Western Europe between 900 and 1700 primarily in terms of innovation in the institutional rules that governed property rights. A major source of institutional innovation was, in their view, the rising pressure of population against increasingly scarce resource endowments. Theodore W. Schultz (1968), focusing on more recent economic history, identified the rising economic value of labor during the process of economic development as a primary source of institutional innovation. North and Thomas would apparently have agreed with Schultz that "it is hard to imagine any secular economic movement that would have more profound influence in altering institutions than would the movement of wages relative to that of rents" (Schultz, p. 1120). And both North and Thomas and Schultz, if they were writing today, would probably give greater attention to the role of expected pay-off as a source of demand for institutional change. It also seems more apparent today than a decade ago that in non-market environments, or in environments where prices are severely distorted, the shadow prices that reflect the real terms of trade among factors and products (or the gap between shadow and market prices) convey information to economic and political entrepreneurs that leads to shifts in the demand for institutional innovation and performance.

Conceptualizing the demand for institutional change in this manner opens up the possibility of a more precise identification of the link between the demand for institutional change and the demand for knowledge in economics and in the social sciences generally. Advances in knowledge in the social sciences in response to the demand for more effective institutions offer an opportunity to reduce the costs of institutional innovation, just as advances in knowledge in the biological sciences and agricultural technology have reduced the costs of technical innovation in agriculture. The demand by policy makers for advances in knowledge about price and market relationships is, for example, appropriately viewed as derived from demand for improved performance on the part of market or non-market institutions.

What evidence can be brought to bear against the hypothesis that the demand for social science knowledge is derived from the demand for institutional innovation? Let me refer to two examples that tend at least to establish the plausibility of the hypothesis.

The first example draws on U.S. historical experience. During the last one hundred years, the United States has experienced three major waves of institutional reform. The first was the "Progressive Period" that spanned the last decade of the 19th century and continued until the U.S. entry into World War I. The demands for reform were induced by the rapid technical and economic changes that had dramatically altered the conditions of American life since the Civil War.[4/] The unifying theme that underlay the reform proposals of the Progressive Era was a rejection of unregulated free-enterprise capitalism. Reforms reflecting this perspective were initiated in the areas of income distribution, labor relations, social services, financial markets, transportation, industrial organization, and resource conservation. Popular demands for "direct democracy" were translated into expansion of women's suffrage, direct election of senators,

and more active participation of voters in the legislative process through the initiative, referendum, and recall. A major consequence of these reforms was to widen substantially the participation of the federal government in economic affairs and in areas previously reserved to the states.

The second major wave of institutional innovation and reform was during the "New Deal" period in the 1930s. The question of whether the New Deal reforms represented a drastic new departure in American reformism (Hofstadter) or primarily the realization of reforms proposed originally during the Progressive Era (Scott; Hughes, pp. 146-198) and incubated during the 1920s (Chambers) has been debated by political scientists and historians. But the New Deal reforms are not too difficult to characterize. They were in defense of security of property, of work, and of income--a reshuffle of the cards that had too long been stacked against the working man, the farmer, and the small businessman (Commager and Morris, 1963, p. xii). But the acceptance by the federal government of responsibility for maintaining economic life did represent a radical break with tradition. The result was a period of six years, 1933 to 1938, that represented the most rapid period of institutional change since the Civil War (Leuchtenberg, 1963, p. xv).

The third wave of institutional reform occurred during the Kennedy and Johnson administrations--the "New Frontier" and "Great Society" years of 1960-1968. The Kennedy and Johnson administrations sought to complete the liberal agenda. They sought to eradicate racial discrimination in voting, housing, jobs, and schooling. And they sought to eliminate poverty--both black and white and urban and rural (Matusow, 1984, pp. 180-271). These reforms were followed in the late 1960s and early 1970s by rapid innovation in new forms of property rights in natural resources induced by a rising concern about the

impact of technology on both material resources and environmental amenities (Ruttan, 1971).

During each of these periods there was rapid growth in the demand for social science knowledge. The first period drew on a broad range of intellectual capacities and expertise in law, in economics, and in the newer social science disciplines--but there was relatively little theory and even less research on which to draw.[5/] During the second period economists played a much larger role in policy design. Unfortunately, lack of an adequate understanding of macroeconomic relationships and a pervasive pessimism about the prospects for growth led to a structuralist reform agenda. But the demands for institutional innovation did lead to substantial growth in the resources devoted to social science research and to strengthening the statistical services of the federal government. By the late 1930s new theory and new information were being brought to bear on institutional innovation and reform. A new class of "service intellectuals" emerged in policy roles in the federal government.[6/] During the 1960s social science research played an even larger role in program design than in the two earlier periods. This was in part because of a greatly expanded body of social science knowledge, a large social science research capacity, and improvements in capacity to generate, process, and analyze social science data. Attempts were made to introduce experimental design as a stage in program development. But in spite of the advances in theory and method, the policy-relevant social science knowledge on which the Kennedy and Johnson administrations were forced to draw in the design of the poverty programs of the 1960s was too weak to respond effectively to the demands that were placed on it (Matusow, 1984, pp. 217-276).

The second example draws more broadly on comparative experience. Stop for a minute and ask, Which societies tend to draw most extensively on social science

knowledge and which societies draw least on social science knowledge in policy design and reform? It seems clear that societies in which the design of social institutions is strongly determined by ideology or religion exhibit a very weak demand for social science knowledge. The USSR, for example, tends to draw primarily on that narrow range of economics most closely related to engineering--input/output analysis, mathematical programming, and sector modeling. In China much of the capacity of agricultural economics is devoted to clarifying the implications of shifts in economic ideology. Relatively little capacity is devoted to institutional design.

It also seems clear that the demand for social science knowledge is strongest in those societies and in those historical periods in which the burdens of ideology, religion, and tradition impose relatively weak constraints on institutional design. And within any society it seems apparent that the demand for social science knowledge is strongest when the society is attempting to confront the problems of the present rather than when it is attempting to recapture romantic memories of the past or pursuing utopian visions of the future. In the 1960s it was possible to believe that the exhaustion of the ideologies that had dominated social thought for the previous century and a half had permanently shifted the demand for social science knowledge to the right (Bell, 1960, pp. 369-375). But this vision is somewhat more clouded when viewed from the perspectives of the 1980s. It is difficult to avoid the conclusion that budget reductions have at times been used to reduce the accumulation of social science knowledge in order to reduce the challenge to ideological purity in policy design.

Social Science Knowledge and the Supply of Institutional Innovation

If one accepts the notion that the demand for knowledge in economics, and in the social sciences generally, is derived from the demand for institutional change, it then becomes necessary to consider the sources of supply of institutional change.

The view that emerges from my own work is that advances in social science knowledge act to shift the supply of institutional change to the right. Throughout history, improvements in institutional performance have occurred primarily through the slow accumulation of successful precedents or as by-products of expertise and experience. Institutional change was traditionally generated through the process of trial and error much in the same manner that technical change was generated prior to the invention of the research university, the agricultural experiment station, or the industrial research laboratory. With the institutionalization of research in the social sciences and related professions, the advancement of social science knowledge relevant to institutional innovation has begun to proceed much more efficiently. It seems apparent that it is becoming increasingly possible to substitute social science knowledge and analytical skill for the more expensive process of learning by trial and error.

But how responsive are advances in social science knowledge to demands arising out of social conflict or economic growth? Is the supply of social science knowledge for institutional innovation relatively elastic? Or is society typically faced with a situation wherein the demand for institutional innovation shifts against a relatively inelastic supply curve? Stigler has argued that the supply of knowledge in the social sciences is relatively impervious to the impact of economic events (Stigler, 1965, pp. 16-30). He also has argued the opposite position (Stigler, 1982, pp. 63-66). My own perspective is consistent with Stigler's more recent view that economists respond rapidly to

changes in the economic and political environment. But I also insist that the advances in economic thought, induced by changes in the economic and political environment, are becoming an increasingly effective substitute for trial and error in the design and reform of economic institutions and economic policy. It does seem clear, however, that our understanding of the sources of supply of institutional innovation are less well understood than the sources of demand for institutional change. The factors that reduce the cost of institutional change have not been widely studied by economists or other social scientists.

If we accept the arguments that (a) the value society places on social science research is derived primarily from its contribution to institutional change and performance and (b) advances in social science knowledge are responsive to demands generated by social and economic change, we are then forced to consider several additional questions. How much freedom does a society have in choosing the path of institutional change that it will follow? Is society as free to design new institutions as planners frequently assume? Or is institutional change so dominated by historical or evolutionary forces that rational design has relatively little role to play in the process?[7/]

The response by economists to these questions can be grouped in two major intellectual traditions. One tradition can be characterized as the design tradition, the other the evolutionary tradition. When we consider the social sciences more generally, we find that there are what might be considered both organic and analytical approaches to the issues of institutional evolution and design. We can illustrate these approaches in the form of a matrix (figure 1).

The analytical-design tradition can be illustrated in the work of my colleague Leo Hurwicz (1972a, 1972b, 1977). The strategy adopted in the formal

Figure 1. Classification of Sources and Approaches to Institutional Innovation

	APPROACHES	
SOURCES	Organic	Analytical
Evolution		
Design		

Note: The terminology employed to address these concepts is used variously by the several social science disciplines. Among the analogs to the term "organic" are "phenomenological" (sociology) and "emic" (anthropology). Among alternatives to the term "analytical" are "positivist" (sociology) and "etic" (anthropology). There is not, of course, complete congruence among the several analogs.

literature on institutional design is to attempt first to distinguish between the institutional mechanism, over which the designer or planner can exercise some degree of analytical control, and the institutional environment, in which changes are treated as exogenous. The research agenda is then to study the performance characteristics of different institutional mechanisms under a wide class of institutional environments.[8/]

My own work (with Yujiro Hayami and Hans Binswanger) on induced institutional innovation falls more within the evolutionary-analytical tradition. In this work we have attempted to test and examine empirically how changes in the institutional environment have been induced by long-term changes in resource endowments and changes in technology.[9/10/]

The history of agricultural economics suggests a strong commitment to the design tradition. Agricultural economists have been intimately involved in the process of institutional design almost since the origin of the field. We have been involved both through our research and through personal involvement in the design and reform of land tenure, credit, and marketing institutions. And our leading practitioners have contributed both to the agricultural policy debates and to the design of agricultural policies and programs. The history of our successes and failures suggests that we have been less sensitive to the constraints placed on design by changes in the economic and social environment. And we have often been insensitive to the design opportunities made possible by changes in resource and cultural endowments or by changes in technology.

I would now like to turn to two examples in which agricultural economists have played active roles in both the advancement of knowledge and in institutional design. My purpose will be to examine the relative contributions of the design logic and of external political and economic forces to the evolution of

policies and programs. The two areas I have selected for examination are (a) the development of the cooperative farm credit system and (b) the development of direct payment approaches in programs to support commodity prices and farm incomes.

The Cooperative Farm Credit System

The Cooperative Farm Credit System as it exists today is a system of federally chartered, privately owned banks and associations organized as cooperatives. The several units that now comprise the system were established in a series of legislative acts in 1916, 1923, 1929, and 1933. The system was substantially reorganized in the 1930s, in the early 1950s, in the early 1970s, and again in the early 1980s. In this section, I would like to review the early history of the system and attempt to assess the contribution of agricultural economists to the design of the system and the impact of economic events in inducing the institutional innovations that led to the establishment and reform of the system.

The development of the Cooperative Farm Credit System should be seen not as an independent event but as part of a broader set of financial market institutional innovations. The bank panic of 1907 stimulated increasing concern about the structure and stability of financial markets. The creation of a cooperative agricultural credit system was a major recommendation of the 1909 report of the Country Life Commission appointed by Theodore Roosevelt and chaired by Liberty Hyde Bailey (Olsen, Brannen, Cadisch, and Newton, p. 185).

Proponents of reform pointed to several continuing structural imperfections in agricultural credit markets (Brake, 1974). Commercial banks were not active in long-term farm mortgage lending. The financing of land transfers was largely provided by farm mortgage brokers and life insurance companies. Interest rates differed widely among regions--ranging in 1914, for example, from below 6 percent in the East to over 9 percent in some western states. Although the Federal Reserve Act loosened the restrictions on agricultural lending by commercial banks, it was regarded as an inadequate response to the long-term credit needs of farmers (O'Hara).

The cooperative land banks, which had developed in a number of European countries, provided the model drawn on by advocates of further reform. In 1912, action was taken at a meeting of the Southern Commercial Congress to send a representative body from the various states (known as the American Commission) to study European agricultural credit systems. In 1913 President Wilson appointed a second commission (known as the United States Commission) to study European agricultural credit systems. The two commissions jointly recommended the establishment of a system of privately owned farm credit banks that would be supervised by the government (Thompson, 1917). The commissions' recommendations, incorporated in the Moss-Fletcher bill and introduced in Congress in 1914, were regarded as inadequate by proponents of a system of cooperative banks or of a federal agricultural credit agency.

The issue was not resolved until July 1916, when a federal farm loan act was passed that established both a private and a cooperative system. The cooperative federal farm land banks were to be financed by the issuance of tax-exempt bonds. In order to permit competition on an equal footing, private banks were also given the right to issue tax-exempt bonds. This was clearly a major institutional innovation. The concept of "using tax-exemption for either public or private firms to influence capital flows on a national scale" represented a radical departure from historical practice (O'Hara, p. 429).[11/]

A second controversial institutional innovation was the "agency market" for securities. The agency market consisted of buyers of securities of agencies wholly or partially owned or chartered by the federal government and was initially developed by the federal land banks. Agency status has been a major source of controversy, since it permits borrowing at near the rate available to the U.S. Treasury on its own securities.[12/]

Legislation establishing the second component of the federal farm credit system, the federal intermediate credit banks, was passed by the Congress in 1923. There had been interest on the part of farm organizations and in the Congress in a more effective system of production credit for more than a decade. A small program of seed loans to farmers was initiated in 1918 by the Department of Agriculture using the facilities of the federal land bank (Wall, p. 921). But the political resources required to resolve the differences among the proponents of alternative approaches and to move legislation through the Congress did not emerge until the financial crisis of 1920-21.

In June of 1921 the Congress created a joint commission on agricultural inquiry. Although numerous issues and solutions were evaluated, the major recommendation of the commission was that the federal land banks extend their operations to include the discounting of agricultural paper for other lending agencies. The act that was passed by the Congress in 1923 provided for the establishment of 12 federal intermediate credit banks. The capital was provided by the purchase of stock in the banks by the U.S. Treasury. The banks were authorized to discount the paper of other lending institutions with maturities in the six-month- to three-year-range (Hoag, pp. 223-226). The 1923 act also provided for the establishment of national agricultural credit corporations which would raise their capital from commercial sources and discount their loans with the federal reserve banks. This portion of the act remained largely inoperative (Hoag, p. 224).

The third component of the pre-1933 federal farm credit system, the Bank for Cooperatives, had its origins in the Federal Farm Marketing Board. The board, established under the Agricultural Marketing Act of 1929, was set up with a revolving fund of $500 million and authorized to engage in agricultural commodity stabilization operations.[13/] It was also authorized to lend to coopera-

tives to enable them to join together to stabilize commodity prices. With limited financial resources and no authority to control production, the board was completely ineffective in responding to the collapse of agricultural commodity prices in the early 1930s (Hoag, pp. 227-230). By 1932, at the pit of the Great Depression, the board had exhausted its funds and had become inactive.

By the early 1930s, the farm credit system that had emerged incrementally over the previous 15 years had become almost inoperative. The troubles of the federal land banks began with a rise in delinquencies following the collapse of the land market in 1921 and worsened as farm land prices continued to decline during the 1920s. The expectation that the federal intermediate credit banks would provide a flow of funds from the central money markets to rural communities failed to materialize. And the authority of the Federal Farm Marketing Board to finance cooperatives collapsed so rapidly that the cooperatives' losses under the boards' commodity stabilization authority were minimal.

The economic crisis of the early 1930s and the commitment of the Roosevelt administration to act to resolve the crisis resulted in a dramatic increase in the demand for social science knowledge. Even before assuming office, the new Roosevelt administration began to explore actively the options available to it for reforming and strengthening the agricultural credit system. This provided an unusual opportunity to draw on both the experience of the 1920s and on the analytical and design capacity in the field of agricultural credit that had been built up by agricultural and other economists over the previous several decades.[14/] The political entrepreneurship and the design skills needed to make this knowledge effective were contributed primarily by Henry Morgenthau, Jr., William I. Myers, and F.F. Hill.

Shortly after his election in November of 1932, Roosevelt selected Morgenthau, then chairman of the New York State Conservation Commission, to

meet with farm organizations, agricultural credit representatives, and congressional leaders to develop plans to solve the financial and commodity price problems faced by farmers. Morgenthau brought William I. Myers, then Professor of Farm Finance at Cornell, to Washington to work with him.[15/]

By December 1932 Myers had produced a design for reform composed of two major actions: (1) provide the land banks with the necessary resources to handle the immediate farm finance emergency and (2) reorganize the cooperative credit system by (a) adding to the federal intermediate credit banks' capacity to channel funds directly to farmers and (b) organizing a decentralized system for financing farmer cooperatives (Hoag, p. 233).

When he assumed office on March 4, 1933, Roosevelt appointed Morgenthau chairman of the Federal Farm Board. On March 27 he issued an executive order making the chairman of the Federal Farm Board the governor of a newly created farm credit administration. The order also consolidated within the Farm Credit Administration the activities and funds of the predecessor agricultural credit agencies and abolished the price stabilization functions of the Federal Farm Board (Hoag, pp. 233, 234). On May 12, 1933, the Congress passed and the president signed the Emergency Farm Mortgage Act that provided the resources necessary for the immediate job of refinancing agricultural debt.

In June of 1933 the Congress passed and Roosevelt signed the Farm Credit Act of 1933 to deal with reforms in the structure of the farm credit system. The act provided for the establishment of 12 regional production credit corporations and the formation of local production credit associations. The initial capital of the local production credit associations was provided by the government through the production credit corporations. Provision was made for the members to replace gradually the government-held stock by member equity.

It also provided for the establishment of 12 district banks for cooperatives and a central bank for cooperatives.

In the fall of 1933 Morgenthau left the Farm Credit Administration to become secretary of the treasury. Myers, who had been the deputy governor, was then appointed governor. Myers remained as governor until he returned to Cornell to head the Department of Agricultural Economics in 1938. He was replaced by Forest F. (Frosty) Hill. Hill had earlier had responsibility for organizing the system of production credit associations.

The farm credit system established by Morgenthau, Myers, and Hill has retained remarkable continuity for more than fifty years. There were, however, several policy decisions made during the initial years that have had important implications for the economic and political viability of the system. One issue that drew a good deal of congressional attention during the early years was whether the Rural Rehabilitation Administration (later the Farm Security Administration (FSA) and now the Farmers Home Administration (FHA)) should be brought under the umbrella of the Farm Credit Administration (FCA). Myers successfully held to the position that the commercial lending functions of the FCA should remain administratively separate from the lending programs of the FSA, which had a larger subsidy element and stronger structural reform objectives.

A second policy issue that has generated considerable tension between the administration, the Congress and the management of the farm credit system, has been the degree of independence of the system. A serious challenge to the system's independence came in 1939 when, at the urging of Secretary of Agriculture Henry A. Wallace, President Roosevelt issued an executive order changing the status of the Farm Credit Administration from that of an independent agency to an agency of the U.S. Department of Agriculture. This was followed by the removal of F. F. Hill as governor of the system and of Albert S. Goss as land

bank commissioner. At least two motivating factors seem to have been involved. One was the interest of Wallace in using the farm credit system to reinforce the commodity programs of the Agricultural Adjustment Administration. It has also been asserted that a second motive was to use the system to support the larger political ambitions of Secretary Wallace. Both concerns received lower priorities after Wallace was elected vice president in 1940. With the passage of the Farm Credit Act of 1953, the Federal Farm Credit Board was established and the Farm Credit Administration was again made an independent agency. At present the functions of the Farm Credit Administration are limited to the examination, supervision, and regulation of the farm credit system.

In retrospect, it seems clear that there were strong economic incentives for reform of the agricultural credit system. During the first decade of this century, there were structural deficiencies in the farm credit markets that represented major obstacles to the development of efficient interregional credit markets. The existing credit system was unresponsive to the needs of an agriculture in which new technology embodied in purchased inputs was becoming an increasingly important source of growth in agriculture. The new federal credit system that evolved became an efficient source of growth, in effect, by reducing the cost of carrying money from Manhattan to Mankato!

The need for reform has continued since 1953 and the system has become increasingly independent. This has been in large part a consequence of the repayment of government capital contributions (completed by the federal land banks in 1947 and by the federal intermediate credit banks, the production credit associations, and the banks for cooperatives in 1968). After the passage of the Farm Credit Act of 1971, the main linkage between the cooperative farm credit system and the federal government was (a) the power of the president to appoint the public members of the Federal Farm Credit Board[16/] and (b) the access of the

system to the "agency market" for securities. It is not difficult to project that the next reform in the system will be a clarification and perhaps a divorce of the farm credit system from its remaining links to the "agency market" for securities.[17/]

Thus, viewed in perspective, the farm credit system represents an institutional innovation that drew upon previous experience in Europe; was triggered by the economic events of the early 1900's; began under public auspicies; experienced considerable refinement, evolution, and redesign to meet new conditions; and is now evolving toward organization as a completely commercial entity, except for the supervision and regulatory functions of the Farm Credit Administration. The system must be judged as having performed effectively on behalf of the agricultural sector when evaluated in terms of providing credit and related services in a timely and cost-effective manner. In retrospect, the Cooperative Agricultural Credit System must be judged as a successful institutional innovation. And agricultural economists can take considerable pride in both the design of the innovation and in contributions to effective performance.

The Compensatory Payments Approach to Farm Income Support

The late 1950s and early 1960s were a period of remarkable vigor in agricultural policy research and in the design of agricultural commodity policy. Much of the professional discussion during this period was dominated by the "supply management" proposals developed and championed by Willard Cochrane. Cochrane served as an advisor to Kennedy during the 1960 campaign, assisted in the drafting of a campaign "white paper" on agricultural policy, and was brought into the Kennedy administration as director of agricultural economics. The design of the commodity program provisions of the proposed Food and Agriculture Act of 1962 was based on the supply management ideas that Cochrane had worked out over the previous decade and a half.[18/] But the most significant policy innovations in the new legislation that finally emerged out of this period drew more heavily on the compensatory or direct payment ideas that were first formally proposed to the Congress in 1949 by Secretary of Agriculture Charles F. Brannan than on the supply management proposals developed by Cochrane.

How did the direct or compensatory payment ideas incorporated in the 1949 Brannan plan emerge? Proposals for a program of countercyclical compensatory payments based on the differences between market prices and some percentage of the price that prevailed during a pre-depression period had been suggested by Theodore W. Schultz in a book in 1943 and in an article in 1944. The proposal was substantially elaborated in his 1946 study for the Committee for Economic Development, Agriculture in an Unstable Economy. Direct payments were also discussed in a number of the papers submitted to the 1945 American Farm Economic Association essay contest on "Price Policy for Agriculture."[19/] By 1948 practically all leading agricultural economists were favorably disposed toward direct payments as an essential element of an effective farm commodity policy (Christenson, p. 28; Brandow, 1977, pp. 238, 239). It was generally agreed that a

system that could provide income support without distorting market prices would more effectively meet both equity and efficiency objectives than policies that attempted to meet income objectives through price supports.

In putting the emergence of proposals for direct or compensatory income payments into perspective, it is useful to recall the environment in which the earlier agricultural programs of the 1930s were initiated. The designers of commodity price programs during the first Roosevelt administration were not able to draw on an extensive body of either program experience or professional analysis and discussion comparable to that available to the designers of the farm credit programs. Agricultural economists, particularly Joseph Davis, M. L. Wilson, Mordecai Ezekiel, John D. Black, Howard Tolley, and George F. Warren, had played an active role in the debates about the merits of the McNary-Haugen and Federal Farm Board proposals of the late 1920s and early 1930s and in the design of the Agricultural Adjustment Act of 1933 (Kirkendall, pp. 30-60).[20/] But their arguments drew on limited data sources and weak understanding of the agricultural sector implications of macroeconomic policy. The extent to which the behavior of agricultural commodity and financial markets reflected the dramatic increase in unemployment and the decline in national income was not clearly understood. It was not until the 1940s that the dialogue between theory, method, and data had advanced to the point at which the agricultural economics literature began to reflect adequately an understanding of what today can be recognized as the Schultz-Cochrane paradigm regarding the macroeconomic basis for the farm crisis of the 1930s or the implications of macroeconomic policy for the design of agricultural programs.[21/]

Farm policy did not emerge as a major issue until late in the 1948 presidential campaign. With the support of the two major farm organizations, both

parties had combined to pass the 1948 Hope-Aiken bill that extended the high wartime price support levels for one year to be followed by a program of flexible price supports. As the election approached, however, the consensus tended to break down. The breakdown was stimulated by the southern Democrats' unwilling support of the Hope-Aiken bill, falling farm prices, farmers' favorable response to Truman's "give 'em hell" campaign rhetoric, and Brannan's vigorous emphasis on a policy of abundance in speeches in support of the Truman candidacy (Matusow, pp. 170-193; Cochrane and Ryan, pp. 26-28).

Following the election both Truman and Brannan agreed that farmers had played a critical role in the Truman victory. Brannan then set in motion steps to translate his commitment to a policy of abundance into the design of a farm program. As an initial step, Brannan assigned Oris V. Wells, then head of the Bureau of Agricultural Economics (BAE), to chair a departmental seminar on national agricultural policy. The regular members of the seminar included the senior policy officers of the department and several of the leading economists of the BAE--John Baker, Louis Bean, O. C. Stein, and Karl Fox. Other economists were involved in the presentation of seminar papers and in some of the individual seminars (Christenson, p. 26). The seminars continued on a twice-a-week schedule from January to early March of 1949, while the Congress impatiently pressed Brannan for his policy proposals.

The topics covered included problems of supporting perishable commodities, multiple price systems, income parity as an alternative to price parity, the food stamp plans, modernization of parity, and compensatory payments. Brannan's role in the seminars came close to approximating the textbook example of the appropriate role of policy makers in drawing on economic analysis. He "said little until the sixth meeting. He knew that if he were to tip his hand on how his thinking was running, it would dry up or deflect the contributions of

the more timid- or ambitious-members" (Christenson, p. 27).

At the sixth meeting on March 3, the secretary concluded the seminars and formed a smaller technical group to work on the final formulation of department policy. On April 6 Brannan met with President Truman to review the economic and political implications of the program. On the same day he also met with the leaders of the major farm organizations to explain the program. And on April 7 he presented his recommendations to a joint hearing of the House and Senate agriculture committee.

The plan that Brannan presented to the Congress reflected "his philosophy of positive government and his goals of income equity to farmers and . . . cheap food for all consumers. Supply and demand were allowed to determine market prices but acceptable incomes for family farmers were to be guaranteed by supplemental payments . . ." (Cochrane and Ryan, p. 29). The proposal represented a major break with the agricultural policies of the 1930s. The provisions included "(1) the use of an income standard, based on a ten-year moving average . . . as a method of computing price support levels for farm products; (2) support for major products . . . at full income standard levels; (3) support of the incomes of growers of perishable commodities by direct payments by the government of the difference between the prices received in the market and the support price established; (4) restriction of supports to large-scale farmers to what efficient family farm units could produce; and (5) requirement of compliance with approved conservation practices and production or marketing controls in order to receive benefits" (Rasmussen, 1983, p. 360).

In retrospect, Brannan's interpretation of the 1948 election as a mandate for his program of abundance was exaggerated (Ryan, 1980). The plan was greeted with a storm of protest. The early proponents of direct payments objected to the revisions in the parity formula that had the effect of raising support levels

(Schultz, 1949, pp. 176-190). The supporters of high support prices objected to the regimentation implied by production controls. Only the Farmers Union supported the payment limitations and the AFL-CIO the cheap food provisions. Initial support for the plan eroded rapidly throughout the 1949 and 1950 legislative sessions. When the Korean War broke out in June of 1950, farm prices surged upward and the problems for which the Brannan Plan was designed appeared to disappear (Christenson, pp. 143-170; Matusow, pp. 201-221).

The attraction of the compensatory payments concept did not die with the Brannan Plan. In 1954 the Congress authorized, with the approval of Secretary of Agriculture Ezra Taft Benson and supported by the votes of most Republican congressmen, a compensatory payments program for support of the income of wool growers, "the Brannan Plan in sheep's clothing," funded with tariff receipts on wool imports (Christenson, p. 167; Benedict and Stein, pp. 352-355). It emerged again in the feedgrain provisions of the Agricultural Act of 1962 in the form of production payments based on the difference between the price support level and the price that would allow wheat to move into international trade without a direct subsidy. In the Agricultural Act of 1964 this provision was extended to maize and cotton (with payments going to handlers in the case of cotton). In the Agriculture Act of 1965 the mandatory features of the earlier supply management program were completely abandoned--"voluntary production control programs with low levels of price supports and direct payment to producers had carried the day in the major commodities. And these program features . . . remained essentially unchanged for five years" (Cochrane and Ryan, p. 82). In the Agricultural Act of 1973 the concept of a "target price" was introduced as a device for determining the size of the income support payment. The target price concept had the effect of further institutionalizing the direct or deficiency payment approach (Cochrane, 1984).

It seems apparent that increased reliance on direct payments in agricultural commodity programs, beginning in the mid-1960s, was induced at least in part by the growing integration of U.S. agriculture into world commodity markets. The high price supports, combined with controls on land use and a variety of subsidies designed to move agricultural surpluses into world markets, were becoming difficult to sustain (Schuh, 1974). The effects of the overvaluation of the dollar, which began in 1949 when a number of European countries undertook major devaluations, were initially masked by the Korean War. Program costs rose during the late 1950s and early 1960s. By the mid-1960s program costs, from acquiring stocks or removing land from production, had become excessively burdensome. The wheat referendum gave policy makers license to lower support levels gradually to a level consistent with the overvalued dollar. A system of payments which permitted agricultural commodities to move into world markets without direct subsidies was more consistent with the opportunity to participate in the growth of agricultural trade. The benefits from a direct payments program when initially proposed by Brannan were primarily in terms of agricultural adjustment and income distribution. By the mid-1960s the gains could also be measured in terms of economic growth and higher farm income (Lopes and Schuh, 1976; Cochrane, 1984). After the initial defeat of the supply management proposals the Freeman-Cochrane-Schnittker team in the department responded skillfully and effectively to design and manage program changes that, by the late 1960s, brought agricultural commodity production and prices close to equilibrium levels for the first time since the end of the Korean War.

Some Lessons

What do the two case studies reviewed in this paper reveal about the demand for and supply of social science knowledge and how such knowledge contributed to institutional design and innovation? Clearly, the case studies are too limited to do more than suggest hypotheses to guide further research. It would also have been useful, for example, to examine institutional innovations such as (a) the "rural free delivery" of mail, which arose out of the farmer protest movement of the late 19th century with no assistance from social science analysis or research,[22] and (b) the food stamp program, in which agricultural economists played a dominant role in both the design and mobilization of political resources.[23]

A first lesson is that deficiencies in social science knowledge relevant to institutional design have at times imposed a substantial burden on the design of effective policy. It seems clear, for example, that both the initial political and economic motivation for the establishment of the cooperative farm credit system and for its reform in the 1930s reflected, at least in part, a failure in economic analysis. A major motivation for the establishment of the federal land banks was a mistaken belief that structural deficiencies in agricultural credit markets were a major reason for the growth of tenancy in American agriculture during the last decade of the 19th century (O'Hara). Analytical failure was also a central feature of the disagreement between Morgenthau and Myers and Secretary Wallace (and the department economists) in the early 1930s. Morgenthau and Myers assumed that farm commodity prices would quickly return to their pre-depression levels (Hoag, p. 235). But the production control proposals advocated by department economists such as Wilson, Ezekiel, and Tolley also reflected the pervasive deficiency in the understanding of macroeconomic relationships in the early 1930s.

In spite of advances in the understanding of the macroeconomic relationships during the 1940s, it seems apparent that the limited ability to translate that understanding into a system of demand and supply relationships, and to estimate empirically the parameters of commodity and sector models, imposed a severe burden on both in the design and the acceptance of the Brannan Plan. For example, except for a few illustrative estimates for individual perishable commodity programs (for hogs, eggs, potatoes, and milk and milk products), Secretary Brannan was not able to present to the Congress overall cost estimates for implementing his proposals.

The first comparative estimates of alternative program costs using a consistent supply and demand framework were synthesized in 1950 for the 1949 crop year by George Mehren. Mehren's estimates suggested, somewhat surprisingly, that the costs of the Brannan Plan would not have been significantly different than costs incurred under the programs that were mandated by the Agricultural Act of 1948 and the Agricultural Act of 1949. But it was not until the research programs of Karl Fox and his associates at the USDA in the early and mid-1950s and of George Brandow and his colleagues on the Interregional Committee on Agricultural Policy in the late 1950s were completed that reasonably consistent estimates of program costs and impact became possible. And it was not until the early 1960s that a substantial body of literature on program costs and impacts became available to policy analysts (Cochrane and Ryan, pp. 359-382).[24/]

By the early 1960s the theory and method for the preparation of such estimates had become fully institutionalized in the USDA and were consistently referred to in debates over commodity policy. It had become customary by the time Willard Cochrane became director of agricultural economics at the USDA to estimate the farm price and income effects, the consumer price effects, the federal budget impact, and the income distribution impact of the farm policy

alternatives that received serious administrative or legislative attention. And I am prepared to argue that these estimates contributed to both the quality of the policy debates and to better policy than would have emerged in the absence of the advances in analytical capacity that occurred over the previous two decades.

A second major lesson that emerges from the cases examined in this paper is that short-run economic and political events can exert a major impact on the effectiveness of social science contributions to institutional design or reform. The depression of the early 1930s resulted in a dramatic increase in demand for social science knowledge in the design of policies and programs. It is unlikely that the reform of the farm credit system would have occurred as rapidly or could have been implemented as effectively except in an environment of economic and political crisis.

But the capacity of social scientists to respond to such opportunities with effective program design is itself dependent on the state of social science knowledge. Roosevelt's election resulted in a discrete shift to the right in the supply function for institution innovation. The political entrepreneurship of Morgenthau, combined with the professional capacity of Myers and Hill, represented an effective supply response to the demand for reform of the farm credit system. This supply response was dependent on the accumulation of a substantial body of research on the farm financial problem and on the behavior of financial markets over the preceding two or three decades (Wall; Olsen, Brannen, Cadisch, and Newton). The result of this coming together of the demand for social science knowledge and a shift in the supply of knowledge resulted in a design for a farm credit system that has been effective and durable.

It is useful to contrast this experience with the design of the farm commodity programs of the 1930s. The department economists who contributed to the design of the commodity and price policies of the 1930s were clearly

among the most brilliant members of the profession. But the economic theory and economic research on which they were forced to draw for policy design was clearly underdeveloped. And the policies they designed have imposed a continuing burden on professional dialogue in the field of agricultural policy and heavy social costs on both farmers and consumers.

A third inference is that both the cooperative credit system and the agricultural commodity programs were induced by fundamental economic forces associated with the development of the American economy and the agricultural economy in particular. The timing of the institutional innovations in farm credit markets was clearly influenced by the political response to the depression of the 1890s, the collapse of land prices in the early 1920s, and the Great Depression of the 1930s. Yet, in retrospect it appears that there were even more fundamental forces operating in the agricultural economy to induce institutional innovation and reform in rural financial institutions. The share of farm assets accounted for by capital inputs rose relative to the share accounted for by land from the 1820s. The value added at the farm level declined as a share of the value of farm sales from the end of the Civil War. New technology embodied in inputs purchased from the nonagricultural sector had become a major source of productivity growth.

These changes represented a source of demand for institutional innovation in agricultural credit markets that could not be denied. There were too many deficiencies and inefficiencies in the financial institutions that served rural areas during the latter part of the 19th century to meet the needs of a modernizing agriculture. This does not mean that the particular form that the institutional reforms took--the evolution of the federal cooperative credit system--was inherent in the fundamental forces that were generating a demand for institutional innovation. It is possible that in a different political environ-

ment the demand for innovations might have been directed more strongly toward private sector institutions.

When we turn to agricultural commodity policy, we find that the influence of longer-run economic forces in the emergence of policies designed to stabilize farm prices and income is also apparent. Before the beginning of this century, the gains in productivity in American agriculture were almost entirely a consequence of increased mechanization. The technological revolution of the 19th century contributed to increasing output per worker but contributed very little to growth in aggregate output (Hayami and Ruttan, 1971, pp. 138-152). The period immediately after the turn of the century was a period of technological stagnation. But by the mid-1920s a new biological technology capable of enhancing output per acre and output per unit of breeding stock was beginning to come on stream. It was becoming possible to increase aggregate output more rapidly than aggregate demand.

In the absence of public intervention in agricultural commodity markets, the gains from the new technology would have been transferred almost immediately from agricultural producers to consumers. In this environment it should not have been surprising that farmers would be unsatisfied with policies that protected them only from the effects of cyclical fluctuations in economic activity. Although farmers and farm leaders articulated these demands in different terms, it seems clear in retrospect that they were demanding economic policies that would dampen the transfer of productivity gains from farm producers to consumers.

I have not in this review presented any formal estimates of rates of return to agricultural economics research. It is quite clear, however, that lack of economic knowledge has at times imposed very heavy costs on American farmers and the American economy. As the participation of American agriculture in world

markets has grown, our capacity to expand the knowledge relevant to institutional reform and design has not kept pace. Private sector research on this issue is almost nonexistent. The 6 or 7 percent of the public agricultural research budget now allocated to economic research represents a substantial underinvestment when evaluated against the gains that can be achieved by substituting economic analysis for trial and error in research policy, financial policy, commodity policy, trade policy, resource policy, and the other areas of applied economics that are amenable to the analytical skills of agricultural economists.

In concluding, I would like to add an important qualification to my enthusiasm about the value of agricultural economics research. One of our major deficiencies, both in the modern tool-using epoch and in the early epoch when we operated primarily with the use of principles unencumbered by significant tool-using capacity, has been our lack of sensitivity to the major sources of economic and social change that have shaped our policies and our institutions. The literature suggests that we have believed that institutional design is simply a matter of analytical skill and political will. We have given relatively little attention to an attempt to understand the rate and direction of the broader historical forces that influence the demand for institutional change. As a result, we have often found it difficult to escape the impact of short-run changes in the economic and political environment, or of the often volatile changes in the intellectual environment.

FOOTNOTES

1/ This usage is consistent with my earlier work (Binswanger and Ruttan, 1978, pp. 327-357; Ruttan and Hayami, 1984), where the term institution is used to include that of organization. The term institutional innovation will be used to refer to innovations that lead to changes (1) in the behavior of a particular organization, (2) in the relationship between such organization and its environment, or (3) in the rules that govern behavior and relationships in an organization's environment. This definition is more inclusive than Veblen's (Seckler, 1975, p. 61) but is consistent with that used by Commons (1950, p. 26) and Knight (1952, p. 51). The definition used here also encompasses the five classes of institutional entities and behavior employed by Davis and North (1971): (1) institutional environment, "the set of fundamental political, social and legal ground rules that establish the basis for production, exchange, and distribution" (p. 6); (2) institutional arrangement, "an arrangement between economic units that governs the ways in which these units can cooperate and/or compete" (p. 7); (3) primary action group, "a decision making unit that has been established by some change in institutional arrangement to help effect the capture of income for the primary action group" (p. 8); (5) institutional instrument, "documents or devices employed by action groups to effect the capture of income external to existing arrangemental structures" (p. 9).

2/ This section and the next section on the supply of institutional innovation draw on earlier discussions in Binswanger and Ruttan (1978, pp. 337-340), Ruttan (1982, pp. 304-308), and Ruttan and Hayami (1984).

3/ For two initial attempts see Hayami and Peterson (1972) and Norton and Schuh (1981). See also the reviews by Norton and Schuh (1981a, 1981b) and Norton and Norris (1984).

4/ For a very useful review of thought regarding the Progressive Era see Scott (1959). For the intellectual, political, and social origins of many of the reforms of the Progressive Era in the earlier farmer protest movements see Hicks (1961, Chapter 15) and Hughes (1977, pp. 96-145).

5/ Among the intellectual social scientists whose names are associated with the intellectual format and policy discussions of the Progressive Era were "John Dewey, Thorstein Veblen, Richard Ely, John R. Commons, Herbert Croly, Louis Brandeis, E.R.A. Seligman, Edward A. Ross, Lester Ward, Arthur F. Bentley, William Dean Howells, Lincoln Steffens, Charles Beard, Jane Addams, Florence Kelly, James Harvey Robinson, J. Allen Smith and Oliver Wendell Holmes" (Scott, p. 698).

6/ The term service intellectual is from Kirkendall (1966). Kirkendall traces the rise of the service intellectual back to origins in the Progressive Era when Governor Robert M. LaFollette actively encouraged the movement of academics from the University of Wisconsin into service of the state government (pp. 1-7).

7/ This issue has been of concern since the origin of modern social science. In 1744 Giambattista Vico, whose role in the origins of political science is comparable to that of Adam Smith in economic thought, argued that it is "naive to regard political and social institutions as owing their origins to acts of rational planning . . . motivated either by considerations of enlightened self-interest or by respect for an abstract concept of justice . . ." (Gardiner, p. 10).

8/ This perspective has been developed by Hurwicz in a series of articles (Hurwicz, 1972a, 1972b, 1977). See also Reiter (1977).

9/ This perspective was initially outlined in Hayami and Ruttan (1971, pp. 59-61). It will be elaborated more fully in the forthcoming revised edition of Hayami and Ruttan (1985). See also Binswanger and Ruttan (1978, pp. 227-357) and Ruttan and Hayami (1984).

10/ The complementarity between the design and induced innovation perspectives was explored in a seminar at the University of Minnesota in February 1983. See Runge (1983).

11/ The issue of tax-exempt financing was itself a response to another institutional innovation, the federal income tax, first imposed in 1913. By the early 1920s there were demands to extend the tax-exemption privilege to other sectors such as housing and municipalities. In 1920 Senator McLean, in criticizing proposed legislation to extend tax-exempt financing to building and loan associations, commented, "If we start on this tax-exemption business, where can we fairly and justly stop it?" (O'Hara, p. 440).

12/ The agency system was established in 1917 when a syndicate of 93 security dealers was formed to handle the first $24 million sale of federal farm land bank bonds. Until 1923, the land bank arrangements for bond sales with the security industry were handled by the office of one of the members of the Federal Farm Loan Board, the supervising agency for the land banks and their local associations. In 1922 the post of fiscal agent was added to the office of the general counsel. In 1929 the fiscal agent's office was moved to New York. In 1973 a federal financing bank was established to handle the sale of securities by most organizations using the agency market. However, the farm credit system was permitted to continue to operate independently in order to give it direct access to national credit markets.

13/ The Congress had twice passed, and President Coolidge twice vetoed (in 1922 and 1927) the McNary-Haugen bill to establish high prices on a "domestic allotment" while exporting surpluses at world prices. The Agricultural Act of 1929 represented a move by the Hoover administration to divert efforts from an attempt to revive the McNary-Haugen bill.

14/ Peter J. Barry has commented in a letter (1984) on the large literature addressed to farm credit issues that appeared in both the American Economic Review and the Journal of Farm Economics between 1900 and the early 1930s. This was in addition to the large bulletin literature reviewed by both Wall and Olsen, et al.

15/ Morgenthau was a personal friend of Roosevelt. In addition to his role as commissioner of conservation in New York, he had served as chairman of Governor Roosevelt's Agricultural Advisory Committee. He was also the owner-publisher of a northeastern farm paper, The American Agriculturalist (Hoag, p. 72). In 1932 Morgenthau apparently viewed himself as a candidate for the position of secretary of agriculture rather than secretary of the treasury (Hill).

16/ The President appoints 12 members to the Federal Farm Credit Board for 6-year terms. The thirteenth member is appointed by the secretary of agriculture and serves at his pleasure. In making his selection the president is obliged to "consider" nominees proposed by the system. In all but three instances since 1953, the president has selected from those nominees. Borrowers elect directors to the district farm credit boards and the central bank for cooperatives board. The governor of the Farm Credit Administration appoints one director-at-large to each of the boards. All district and central bank for cooperatives directors serve 3-year terms (Harshbarger, 1984).

17/ Whenever the system sells securities it is obliged to "consult" with the U.S. Treasury. As of mid-1984 the Treasury has not blocked the system's entry into the agency market. Over the years, however, several administrations, including the Reagan administration, have attempted to limit the system's "agency status."

18/ Cochrane's perspectives on aggregate economic relations for the agricultural sector began with a paper published in 1947 and were articulated most completely in his book, Farm Prices: Myth and Reality (1958). For a discussion of Cochrane's role in the design of the Food and Agricultural Act of 1962 see Hadwiger and Talbot (1965).

19/ The American Farm Economic Association essay contest on "Price Policy for Agriculture" reflected an exceptional interest in the design of post-war agricultural policy. Over 300 essays were submitted. The major theme of the award papers was greater freedom in pricing of individual commodities combined with some form of "forward pricing" to guide production and minimum or flexible price support guarantees. Direct payments for farm income support represented a subsidiary theme. For the award papers see Nicholls (1945), Johnson (1945), and Waugh (1945). The Cochrane (1945) honorable mention paper, which drew on his 1945 Harvard Ph.D. thesis, emphasized production adjustment, equilibrium market prices, and abundant and inexpensive food supplies for consumers (Cochrane, 1945). The food abundance theme became an important issue in the Brannan proposal in 1948.

20/ John D. Black would give somewhat less credit (or blame) to the department economists. According to Black, "A little contemplation will convince anyone that in the great surge toward collective action in the agricultural economy of this and other nations since the World War, the economists have generally been considerably behind the lines of battle--many of them engaged in rear guard fighting. Not only the drive toward action but also the major part of the thinking about effective lines of action has come from outside the strictly professional ranks--from men like the two Wallaces, George Peck, Chester Davis, Governor Lowden, Alexander Legge, Edward O'Neal, even Rexford Tugwell if you like. This is in spite of the fact that in this particular case an unusual amount of aid has been rendered by several professional agricultural economists--Dr. H. C. Taylor in the days when he served with the elder Wallace, M. L. Wilson, H. R. Tolley and L. C. Gray; in the field of agricultural credit W. I. Myers and F. F. Hill. 'Cock-eyed' and 'screwy' though we economists may dub some of the ideas of some of these men, they have nevertheless set

the stage and written many of the parts of the drama of agriculture in the last 16 years" (Black, 1939). See also Gaus and Wolcott (1940, pp. 65, 66).

21/ The weakness of agricultural policy analysis and discussion by economists before the 1940s has been noted by Wilcox (1963). Brandow notes that by the early 1950s there was "a group of economists who tended to approach policy analysis in a particular way and who came to similar policy conclusions; this group . . . included T. W. Schultz, D. G. Johnson, W. H. Nicholls, O. H. Brownlee, and R. Schickele. A group in the USDA Bureau of Agricultural Economics . . . owed much to the leadership of H. R. Tolley and included among others, B. W. Allin, W. W. Cochrane, J. G. Maddox, O. C. Stine and O. V. Wells; J. D. Black in his pragmatic way worked closely with the Tolley group, S. E. Johnson, J. P. Cavin, and others in the USDA" (Brandow, 1977, p. 241). Brandow also comments "though in retrospect Cochrane's analysis seems to be generally consistent with ideas presented . . . by Schultz, it is instructive to note that Cochrane's first articles did not present it in that context and that Schultz so severely criticized the details and emphasis of Cochrane's analyses as to appear to reject it. This was not the first or last time that economic ideas subsequently seen to be closely related were initially thought of as sharply different" (Brandow, 1977, p. 219).

In retrospect, it appears that the major difference between Schultz and Cochrane was not so much a difference in their analysis of the sources of the farm problem or the behavior of the agricultural economy but in their policy proposals. Schultz was more concerned with the protection of farm incomes from the effects of macro-instability. Cochrane was more concerned with protecting farm income from the effects of overcapacity associated with rapid technical change. See Cochrane's critical discussion of income payments (1946).

22/ Legislation authorizing an experimental program of free mail delivery in rural areas was passed by the U.S. Congress in 1892. The program was not initiated, however, until 1896. The service grew rapidly during its first decade but it was not until 1926 that the system was fully developed. Legislation extending rural delivery of parcel post was passed in 1912 (Fuller, 1964). Fuller suggests that rural free delivery was almost the only positive accomplishment of the farmers' protest movement of the 1890s (p. 35).

23/ The food stamp program was first initiated in 1939. It was discontinued in 1943 and revised again in the early 1960s (Benedict, 1955, pp. 289-294).

24/ The definitive reports in these two efforts were Fox (1953) and Brandow (1961).

REFERENCES

Barry, Peter J. "Letter," July 3, 1984.

Bell, Daniel. The End of Ideology. Glencoe, Ill: Free Press, 1960.

Benedict, Murray R. Can We Solve the Farm Problem: An Analysis of Federal Aid to Agriculture. New York: Twentieth Century Fund, 1955.

Benedict, Murray R. and Oscar C. Stein. The Agricultural Commodity Programs: Two Decades of Experience. New York: Twentieth Century Fund, 1956.

Binswanger, Hans P. and Vernon W. Ruttan. Induced Innovation: Technology, Institutions and Development. Baltimore: Johns Hopkins University Press, 1978.

Black, John D. "Contributions of Agricultural Economists: Discussion." Journal of Farm Economics 21 (February 1939):25-30.

Brake, John R. "A Perspective on Federal Involvement in Agricultural Credit Programs." South Dakota Law Review 19(Summer 1974): 567-602.

Brandow, G. E. "Interrelations among Demands for Farm Products and Implications for Control of Market Supply." State College, Penn.: Pennsylvania Agricultural Experiment Station Bulletin 680, 1961.

Brandow, G. E. "Policy for Commercial Agriculture, 1945-71." A Survey of Agricultural Economics Literature, edited by Lee R. Martin, vol. I. Minneapolis: University of Minnesota Press, 1977.

Chambers, Clarke A. Seedtime of Reform: American Social Service and Social Action: 1918-1933. Minneapolis: University of Minnesota Press, 1963.

Christenson, Reo M. The Brannan Plan: Farm Politics and Policy. Ann Arbor: University of Michigan Press, 1959.

Cochrane, Willard. "A Price Policy for Agriculture, Consistent with Economic Progress That Will Promote Adequate and More Stable Income from Farming." Journal of Farm Economics 27 (November 1945):813-820.

Cochrane, Willard W. "Income Payments as a Substitute for Support Prices." Journal of Farm Economics 28 (November 1946):1024-1029.

Cochrane, Willard W. "Farm Price Gyrations--An Aggregate Hypothesis." Journal of Farm Economics 29 (May 1947):383-408.

Cochrane, Willard W. Farm Prices: Myth and Reality. Minneapolis: University of Minnesota Press, 1958.

Cochrane, Willard W. and Mary E. Ryan. American Farm Policy, 1948-1973. Minneapolis: University of Minnesota Press, 1976.

Cochrane, Willard W. "Agricultural Policy in the United States--A Long View." Paper presented in Benjamin Hibbard Memorial Lecture Series, University of Wisconsin, Madison, Wisconsin, April 13, 1984.

Commager, Henry Steele and Richard B. Morris. "Editor's Introduction." In Franklin D. Roosevelt and the New Deal, 1932-1940, William L. Leuchtenburg, New York: Harper and Row, 1963.

Commons, John R. The Economics of Collective Action. New York: Macmillan Co., 1950.

Davis, Lance E. and Douglass C. North. Change and American Economic Growth. Cambridge: Cambridge University Press, 1971.

Fox, K. A. The Analysis of Demand for Farm Products. Washington, D.C.: USDA Technical Bulletin 1081, 1953.

Fuller, Wayne Edison. RFD, the Changing Face of Rural America. Bloomington: Indiana University Press, 1964.

Gardiner, Patrick, ed. Theories of History. Glencoe, Ill.: Free Press, 1959.

Gaus, John M. and L. O. Wolcott (with V. B. Lewis). Public Administration in the United States Department of Agriculture. Chicago: Public Administration Service, 1940.

Hadwiger, Don F. and Ross B. Talbot. Pressures and Protests: The Kennedy Farm Program and the Wheat Referendum of 1963. San Francisco: Chandler Publishing Co., 1965.

Harshbarger, C. Edward. "Letter," July 2, 1984.

Hayami, Yujiro and Willis Peterson. "Social Returns to Public Information Services: Statistical Reporting of U.S. Farm Commodities." The American Economic Review 63 (March 1972):119-130.

Hayami, Yujiro and Vernon W. Ruttan. Agricultural Development: An International Perspective. Baltimore: The Johns Hopkins University Press, 1971.

Hayami, Yujiro and Vernon W. Ruttan. Agricultural Development: An International Perspective, rev. ed. Baltimore: Johns Hopkins University Press, 1985.

Hicks, John D. The Populist Revolt. Lincoln: University of Nebraska Press, 1961.

Hill, F. F. "Personal Discussion," March 1984.

Hoag, W. Gifford. The Farm Credit System: A History of Financial Self Help. Danville, Ill.: Interstate Printers and Publishers, 1976.

Hofstadter, Richard. The Age of Reform: From Bryan to F.D.R. New York: Knopf, 1955.

Hughes, Jonathan R.T. The Governmental Habit: Economic Controls from Colonial Times to the Present. New York: Basic Books, 1977.

Hurwicz, Leonid. "Organizational Structures for Joint Decision Making: A Designer's Point of View." Interorganizational Decision Making, edited by Mathew Tuite, Roger Chisholm, and Michael Radnor. Chicago: Aldine, 1972a.

Hurwicz, Leonid. "On Informationally Decentralized Systems." Decision and Organization, edited by C. B. McGuire and Ray Radnor. Amsterdam: North Holland, 1972b.

Hurwicz, Leonid. "On the Interaction between Information and Incentives in Organizations." Communication and Control in Society, edited by K. Krippendorf. New York: Scientific Publishers, Inc., 1977, pp. 123-147.

Johnson, D. Gale. "A Price Policy for Agriculture, Consistent with Economic Progress, That Will Promote Adequate and More Stable Income from Farming." Journal of Farm Economics 27 (November 1945):743-759.

Kirkendall, Richard S. Social Scientists and Farm Politics in the Age of Roosevelt. Columbia: University of Missouri Press, 1966.

Knight, Frank H. "Institutionalism and Empiricism in Economics." American Economic Review 42(May 1952):45-55.

Leuchtenburg, William L. Franklin D. Roosevelt and the New Deal, edited by Henry Steele Commager and Richard B. Morris. New York: Harper and Row, 1963.

Lopes, Mario and G. Edward Schuh. "Price Support Versus an Equilibrium Exchange Rate: A Comparison of Income Distribution Consequences." Contributed Paper, Annual Meeting of American Agricultural Economics Association, Pennsylvania State University, August 15-18, 1976.

Matusow, Allen J. The Unraveling of America: A History of Liberalism in the 1960's. New York: Harper and Row, 1984.

Mehren, George. "Comparative Costs of Agricultural Price Support in 1949." American Economic Review 41 (May 1951, proceedings):718-757.

Nicholls, William H. "A Price Policy for Agriculture, Consistent with Economic Progress, That Will Promote Adequate and More Stable Income from Farming." Journal of Farm Economics 27 (November 1945):743-759.

North, Douglass C. and Robert Paul Thomas. "An Economic Theory of the Growth of the Western World." The Economic History Review 22 (1970):1-17.

North, Douglass C. and Robert Paul Thomas. The Rise of the Western World. London: Cambridge University Press, 1973.

Norton, George W. and G. Edward Schuh. "Agricultural Social Science Research Evaluation." Department of Agricultural Economics, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, 1981a.

Norton, George W. and G. Edward Schuh. "Evaluating Returns to Social Science Research: Issues and Possible Methods." Evaluation of Agricultural Research, edited by Walter L. Fishel, Arnold A. Paulsen, and W. Burt Sundquist. St. Paul: University of Minnesota Agricultural Experiment Station Miscellaneous Publication 8-1981, April 1981b, pp. 247-61.

Norton, George W. and Patricia E. Norris. "Evaluating Agricultural Economics Research." Department of Agricultural Economics, Virginia Polytechnic Institute and State University, Blacksburg, Virginia, 1984.

O'Hara, Maureen. "Tax Exempt Financing: Some Lessons from History." Journal of Money, Credit and Banking 15 (November 1983):425-441.

Olsen, Nils A., C. O. Brannen, G. F. Cadisch, and R. W. Newton. "Farm Credit, Farm Insurance and Farm Taxation." Yearbook of Agriculture, 1924. Washington, D.C.: U.S. Government Printing Office, 1925, pp. 185-284.

Rasmussen, Wayne D. "New Deal Agricultural Policies After Fifty Years." Minnesota Law Review 68 (December 1983):353-376.

Reiter, Stanley. "Information and Performance in the $(New)^2$ Welfare Economics." American Economic Review 67 (February 1977):226-234.

Runge, Carlisle Ford. "Sources of Institutional Innovation: An Interpretive Essay." Minneapolis: University of Minnesota Department of Economics Discussion Paper 176, June 1983.

Ruttan, Vernon W. "Technology and the Environment." American Journal of Agricultural Economics 53(December 1971): 707-717.

Ruttan, Vernon W. Agricultural Research Policy. Minneapolis: University of Minnesota Press, 1982.

Ruttan, Vernon W. and Yujiro Hayami. "Toward a Theory of Induced Institutional Innovation." Journal of Development Studies 20 (July 1984): 203-223.

Ryan, Thomas G. "Farm Prices and the Farm Vote in 1948." Agricultural History 54 (July 1980):387-401.

Schuh, G. Edward. "The Exchange Rate and U.S. Agriculture." American Journal of Agricultural Economics 56 (February 1974):1-13.

Schuh, G. Edward, "Agricultural Research: How It Should Be Affected by Exports." Agricultural Engineering 65 (May 1984):8-12.

Schultz, Theodore W. Redirecting Farm Policy. New York: Macmillan Co., 1943.

Schultz, Theodore W. "Two Conditions Necessary for Economic Progress in Agriculture." Canadian Journal of Economics and Political Science 10 (1944):298-311.

Schultz, Theodore W. Production and Welfare of Agriculture. New York: Macmillan Co., 1949.

Schultz, Theodore W. "Institutions and the Rising Economic Value of Men." American Journal of Agricultural Economics 50 (December 1968):1113-22.

Scott, Andrew M. "The Progressive Era in Perspective." The Journal of Politics 21(November 1959): 685-701.

Seckler, David. Thorstein Veblen and the Institutionalists. London: Macmillan and Co., 1975.

Spengler, Joseph J. "Exogenous and Endogenous Influences in the Formation of Post-1970 Economic Thought: A Sociology of Knowledge Approach." Events, Ideology and Economic Theory, edited by Robert V. Eagly. Detroit: Wayne State University Press, 1968.

Stigler, George J. Essays in the History of Economics. Chicago: University of Chicago Press, 1965.

Stigler, George J. The Economist as Preacher and Other Essays. Chicago: University of Chicago Press, 1982.

Thompson, C. W. "The Federal Farm Loan Act." American Economic Review 7 (Supplement, March 1917):115-131.

Wall, Norman, J. "Farm Finance." The Story of Agricultural Economics in the United States, 1840-1932, Henry C. and Anne Dewees Taylor. Ames, Iowa: Iowa State College Press, 1952.

Waugh, Frederick V. "A Price Policy for Agriculture Consistent with Economic Progress That Will Promote Adequate and More Stable Income from Farming." Journal of Farm Economics 27 (November 1945):773-789.

Wilcox, Walter W. "Introduction: Agricultural Policy." Economics for Agriculture: Selected Writings of John D. Black, edited by James P. Cavin. Cambridge, Mass.: Harvard University Press, 1963, pp. 553-572.