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**A
SURVEY OF
AGRICULTURAL
ECONOMICS
LITERATURE**

VOLUME 2

*Quantitative Methods
in Agricultural Economics,
1940s to 1970s*

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Gordon C. Rausser, and Lee R. Martin, editors*

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Appendix (Part IV). A Brief Review of the Literature by Subject Category

The references at the end of Part IV include, in addition to the sources cited in the text, many sources dealing with various other aspects of agricultural economic information systems and a large number of periodical sources of agricultural economic data. In the present section the major postwar references not cited elsewhere are classified by subject category.

Originally we had hoped to include in Part IV a complete listing of the principal periodical sources of data available to United States agricultural economists. It was our plan to identify the periodicals and to provide information on the sources and data series maintained by each periodical. Constraints on time and the magnitude of the proposed task ruled out this alternative. Although preparation of an exhaustive listing of the principal periodical sources was not feasible, many of these sources are included in the references at the end of Part IV.

An important outgrowth of our inquiry was the discovery that work now being undertaken will eventually fill this gap and will generate new contributions to the agricultural economics information system. In a letter of February 28, 1977, Gaylord E. Worden, then director of the Data Services Center of the Economic Research Service and now with the Statistical Policy Division, Office of Management and Budget, wrote as follows:

We have our concepts pretty well decided and have started active recruitment for someone to lead this new thrust. The Data Resource Cen-

ter will be a part of our data management services in the Data Services Center, a service division in ERS.

The Data Resource Center would be a computer supported information base containing available and constructed documentation on data used in ERS and other data that would be available to ERS. The information would answer as many as possible of the types of detailed subject matter questions from researchers as well as technical information needed by the data processing staff. The Center would also track statistical and data base activities at the federal level and other key areas to keep the ERS research staff better informed on changing availability of data, etc.

Over time, *the Center could add capability to access bibliographic and information bases needed by the research staff and include more documentation on data uses, data flows, research models and research systems used in ERS.* For example the type of information in Agricultural Handbook No. 365 could be a part of the system and updated fairly routinely and automatically. [Italics added.]

For detailed information on the data series currently maintained by the ERS, the SRS, and the AMS, see USDA Agriculture Handbook 365 and USDA Miscellaneous Publications 1088 and 1308. New publications in agricultural economics from the ERS and the SRS are listed inside the back cover of the ERS monthly periodical, *Agricultural Outlook*.

Information Systems and Purposes

The references in this category include a few publications on the issue of statistical confidentiality and on data interpretation. The remainder of the publications in this category are broad in their approach. Dunn [1974] provides many other useful references on information systems and privacy.

Sources. Bancroft [1972]; Bolling [1956]; Bowman [1968]; Callander [1949]; W. W. Cochrane [1961]; Cox [1962]; Demsetz [1969]; Dunn [1966, 1974]; Fellegi [1972]; E. N. Gilbert [1958]; Hayek [1945]; Hildreth [1967]; Hirshleifer [1971]; Juster [1970]; Klein [1971]; Kuhn [1970]; G. E. Lee and Nicholson [1973]; Lunde [1975]; Marschak [1971]; Orcutt [1970]; Rosenblatt, Glaser, and Wood [1970]; Schnittker [1963]; Shannon and Weaver [1969]; Shoemaker [1962]; Simerl [1962]; Simpson [1966]; Szaniawski [1967]; Trelogan [1962]; Weeks [1972]; Weeks, Schluter and Southard [1974]; Weiner [1974]; Wells et al. [1954]; Wickens [1953]; Wilcox and Ebling [1949].

Theoretical and Operational Concepts

Increased interest in the conceptual foundations of information systems has

generated a steady flow of publications, although many more deal with problems in the development of operational concepts or variables than with the development of satisfactory theoretical constructs. Only one reference in this category deals with data interpretation. The development of operational and theoretical constructs receives some attention from writers of articles in the other categories, particularly in "Critical Evaluations."

Sources. Ackerman and Riechen [1964]; Arrow [undated]; Bachman et al. [1948]; Berndt and Christensen [1974]; Birnbaum [1962]; Christensen [1975]; Christensen and Manser [1975]; Ducoff and Hagood [1947]; Fritsch et al. [1975]; Fromm [1973]; E. N. Gilbert [1958]; Griliches [1963]; Herriot and Spiers [1975]; Hickman [1964]; Horring [1961]; Hotelling [1958]; Houthakker [1968]; Howe, Handy, and Traub [1975]; Hulten [1974]; Hurley [1962]; Koffsky [1962a]; Marion and Handy [1973]; Marshall [1962]; Masucci [1962]; Mighell [1969]; Naive, Cox, and Wiley [1957]; Nikolitch and McKee [1965]; Nybrotten [1953]; Pallesen [1962]; Randall [1968]; Randall and Masucci [1963]; Randall and Rojko [1961]; Rymes [1972]; Schnittker [1959]; Shaw [1967]; Sheehy and McAlexander [1965]; Sheldon [1960]; Siegel [1956]; Star [1974]; Stine [1946]; USDA, ERS [1972a, 1972b]; Vining [1953]; Weeks [1972]; Weeks, Carlin, et al. [1972]; Welsch and Moore [1965]; Winkler [1963]; Zusman [1967].

Data Collection Methods

There is a large body of literature on the methodology of data collection, particularly on data obtained from sampling. Many of these studies come from statisticians and economists who are producing numbers, even though they are often focused on methodology, with the methods illustrated by application to numbers. We would characterize them as more constructive than critical.

Sources. ASA, Advisory Committee [1953]; Backrock and Scable [1967]; Bailer [1973]; Bailer and Tepping [1973]; R. M. Brooks et al. [1974]; Buse [1973]; Clausen and Ford [1957]; R. S. Cochrane [1965]; Ferber [1966]; Finkner [1952]; French and Kranz [1957]; Grieves [1954]; Hall [1969]; Hansen and Hurwitz [1946]; Hartley [1962, 1965]; Hendricks [1949]; Hendricks, Searls, and Horvitz [1964]; Houseman [1947, 1949, 1950, 1953, 1957]; Huddleston [1950, 1965, 1968, 1971]; Hurley and Smith [1951]; Jebe [1952]; Jebe and Clifton [1956]; Jessen [1947, 1955]; Kelly [1958, 1963]; Kirkbride [1969]; Kish [1962]; Knutson and Harmston [1950]; McGregor and Frost [1959]; McVay [1947]; Neter and Waksberg [1964]; Reed [1949]; Rogers [1965]; Scholl and Burkhead [1949]; Shaffer [1959a, 1959b, 1959c]; Shaudys [1969]; C. C. Smith [1952]; Stout [1962]; Sud-

man and Ferber [1971]; R. G. Thompson [1963]; Trelogan [1966, 1968a, 1968b, 1971]; Tsai [1973]; Vickery [1956]; Vincent [1959]; Vogel [1973, 1975]; Wallace [1955]; West [1965]; W. H. Williams and Mallows [1970].

Evaluations of Methodology

The methodologies employed in information systems are frequently criticized in the literature. Evaluations and suggestions for improvements come from analysts within the information system and elsewhere.

Sources. Abel [1962]; Adelman and Griliches [1961]; Bailey, Muth, and Nourse [1963]; Boxley, Gibson, and Hoffnar [1964]; Budd [1971]; Ducoff and Bancroft [1945]; Edgington [1963]; Ferber [1949]; Foote and Bean [1951]; Foote and Fox [1952]; Foote and Weingarten [1958]; Gale [1968]; Gonzalez [1973]; Houseman [1972]; Houseman and Reed [1954]; Jorgenson [1964]; Light, Mosteller, and Winokur [1971]; McHugh [1961]; Morgan and Sonquist [1963]; Puterbaugh [1961]; Sarle and Robinson [1949]; Sell-tiz et al. [1964]; Wales and Ferber [1963]; Wigton and Kibler [1972].

Evaluations of Information Systems, Programs, Concepts, and Data

Rarely does the program of the annual meetings of the American Agricultural Economic Association not include a session on agricultural economic data. The peak may have been reached when almost all of the November 1939 issue of *Journal of Farm Economics* was devoted to eleven articles in this area, including several excellent evaluations and several suggestions for improvement.

About half of the representative sources listed in this category are written from the standpoint of information producers (engaging in self-criticism or intramural criticism) and about half from the standpoint of information users. Sometimes the two groups seem to "talk past" each other because they tend to focus on relatively narrow aspects of an information system, not the system as a whole. Nevertheless, nearly every aspect of information has received its share of critical review, and many evaluations offer critiques and suggestions in several areas.

Sources. ASA, Advisory Committee [1948]; Bachman [1958]; Barlowe and Vlasin [1974]; Bawden and Kershaw [1973]; Beck [1955]; Becker [1951]; Becker and Harlan [1939]; Benedict [1939]; Benedict and Kuznets [1958]; Benedict, Tolley, et al. [1944]; Bhatia [1971]; Bodin [1955]; Boger [1961, 1966]; Breimyer [1968]; Burroughs [1950]; Clawson [1966]; Clough [1951]; W. W. Cochrane [1966]; Daly [1963, 1966, 1969]; Denison [1969];

Dyer [1975]; Ebling [1939]; Eisgruber [1973]; Erickson [1971]; Ferris [1962]; Fox [1953]; S. J. Gilbert [1955]; Griliches [1960]; Grove [1967]; Gunnelson, Dobson, and Pamperin [1972]; Halcrow and Hieronymus [1959]; Hale [1939]; Hardin [1946]; Haren [1975]; Harris [1962]; Hathaway [1959, 1963]; Hayenga [1971]; Heflebower [1951]; Hendricks [1955]; Hoffman [1966]; Houk [1957]; Houseman [1955]; Howe and Handy [1975]; Hurley [1965]; Hurley, Jabine, and Larson [1963]; Hurwitz [1962]; Ives [1957]; Jessen [1939, 1942]; D. G. Johnson and Nottenburg [1951]; Jorgenson and Griliches [1967, 1972a, 1972b]; Keith and Purcell [1976]; Kizer [1967]; Koffsky [1947]; Kottke [1964]; Krueger [1963]; Kutish [1955]; I. M. Lee [1952]; Loomis [1957]; Lowenstein [1954]; Luby [1957]; McAllister [1950]; McCormick [1955]; W. K. McPherson [1956]; McVay and Tucker [1950]; Murray [1939]; National Advisory Commission on Food and Fiber [1967]; T. R. Nelson [1967]; Newell [1953, 1957, 1958a, 1958b]; Nordquist [1956]; Paarlberg [1950]; Pearson and Brandow [1939]; Ramsey [1959]; Riley [1956]; Ruttan [1954, 1963]; Sarle [1939]; Sarle, Heimberger, et al. [1953]; Schrader [1951]; Scoville [1959]; Sherr [1960]; Shiskin [1960]; Sinclair [1951]; R. H. Smith [1954]; R. K. Smith [1955]; Snedecor [1939]; Spielman and Weeks [1975]; Stapp [1958]; Stauber [1959b, 1964]; H. C. Taylor [1939]; H. M. Taylor [1950]; Teper [1956]; Timm [1966]; Todd and Ziricle [1952]; Trelogan [1972]; U.S. Congress [1952, 1957, 1960, 1967b, 1971, 1972]; U.S. Congress, Office of Technology Assessment [1976a]; U.S. Department of Commerce, Intensive Review Committee [1954]; U.S. Government [1971]; Upchurch [1974]; W. F. Williams, Bowen, and Genovese [1959]; Woytinsky and Woytinsky [1939]; Wright and Torgerson [1975].

Information and Data Needs

A large and diverse body of literature is devoted to the data and information needed by analysts and decision makers. Some of the suggestions come from data or information users, some from data or information producers. The suggestions range from demands for narrow bands of data to well-thought-out suggestions for large additions to existing information systems.

Sources. Borum [1955]; Bottum and Ackerman [1958]; Bryant [1973]; Budd [1971]; Butz [1966]; Daft [1973]; David [1976]; Ebling and Ahlgren [1954, 1959]; C. Edwards [1969, 1973]; Ewing [1956]; Gardner [1973, 1975]; Gillett [1948]; Grove [1969]; Hathaway [1972]; Houseman [1964]; Hurley [1949, 1954, 1958]; Madden [1970, 1973]; Mayer and Ahalt [1974]; Mendelowitz [1971]; Raup [1959]; Schaars [1955]; Schultze [undated];

J. T. Scott and Heady [1969]; Sturt [1972]; Sundquist [1970]; Thomas [1956]; Vlasin [1973]; Vlasin, Libby, and Shelton [1975]; Webb [1956]; Westcott [1956]; White [1964]; Wilcox [1956].

Reports of Advisory Committees

Sources. AFEA, Agricultural Data Committee [1957]; ASA, Advisory Committee on Statistical Policy [1953]; ASA, Census Advisory Committee [1951]; ASA, Committee on Census Enumeration Areas [1954, 1955]; Fuller, Gillett, et al. [1953]; Rathbun [1972].

Relationship between Agricultural Economic Data and National Economic Data

With the increased interest in aggregate models—including input-output models and econometric models—more attention has been given to the compatibility of agricultural economic data and concepts with the data and concepts used to describe the complete economic system. Similar concern has been focused on income generation and capital formation for the farm and nonfarm sectors. All these forms of interdependence bid fair to occupy a good deal of the time of agricultural economists and macroeconomic model builders.

Sources. Brake [1974]; Brake and Barry [1971]; Christensen and Jorgenson [1973]; de Leeuw [1962]; Denison [1969]; Ducoff and Hagood [1946]; Dunn [1971]; Fabricant [1959]; V. Fuller and Van Vuuren [undated]; Haavelmo [1947]; Jorgenson and Griliches [1967, 1972a,b]; Kendrick [1961, 1972, 1973]; Penson and Baker [1978]; Rice, Hinrichs, Tolley and Hauser [1945]; Robbins [1963]; Ruggles and Ruggles [1971]; UN [1968]; UN, FAO [1973]; UN, FAO [1971]; Wells [1961].

Explanations and Illustrations of Data Series

A considerable body of literature is devoted to explanatory materials on data series (especially on changes therein) and on data systems. Most of the publications reflect the viewpoint of data producers. The explanations usually include data collection procedures as well as information processing procedures.

Sources. Allison, Zwick, and Brinser [1958]; Banks and Shapiro [1971]; Barton and Durost [1960]; Bayton [1950]; Borum [1951]; Bosecker and Ford [1976]; Bowman and Martin [1962]; Boxley [1971]; E. M. Brooks [1949]; Burk [1959]; Burk and Lanahan [1958]; Callander and Sarle [1947]; Caudill [1965]; Cavin [1952]; Ciancio and Tortora [1976]; Eckler and Taeuber [1954]; Grove [1954]; Hansen [1965]; Harlan [1947]; Hendricks [1947,

1963]; Hendricks and Huddleston [1955]; Jacobs [1975]; Knutson [1949]; Koffsky [1958, 1966]; Landau and Brandt [1966]; A. T. M. Lee and Bachman [1953]; Marsh and Conklin [1953]; Morton [1969, 1972]; Nordquist [1952]; Ogren [1956]; Parker [1951]; Parker and Holmes [1958]; Peterson [1947, 1950]; Purcell and Raunika [1971]; Quackenbush [1954]; Quackenbush and Shaffer [1960]; Randall [1968]; Robinson and Wallrabenstein [1949]; F. S. Scott, Jr. [1955]; Sells [1975]; Senf [1949]; Simon [1958]; Stauber [1950, 1959]; Taeuber [1947, 1957, 1971]; USDA [1958, 1959]; USDA, AMS [1957]; USDA, ERS [1975]; USDA, FCA [1968]; USDA, SRS [1967]; U.S. Department of Labor, BLS [1974]; Wells [1950, 1958].

Evaluative Techniques

The publications in this category are concerned with the development or use of evaluative techniques on different aspects of information.

Sources. Bullock [1976]; Fellegi and Krotki [1968]; Ferber [1955]; Ingram and Prochaska [1972]; Marks, Mauldin, and Nisselson [1953]; H. T. Shapiro [1973].

Economic Forecasting Models

Sources. Barr and Gale [1973]; Crom [1972]; Cromarty [1959]; Daly [1963]; K. A. Fox [1953]; Kuznets and Harvey [1953]; Leuthold et al. [1970]; Palmer and Schlotzhauer [1950]; Parr and Calvin [1956]; Theil [1958].

Foreign Agricultural Economic Information

Sources. Ball and Gardella [1967]; CIDA [1963]; Hirsch [1947]; Koenig [1951]; United Nations [annual], *Statistical Yearbook*; United Nations, FAO [annual], *Yearbook of Food and Agriculture Statistics*.

References (Part IV)

- Abel, M. E. [1962]. "Harmonic Analysis of Seasonal Variation with an Application to Hog Production." *J. Am. Stat. Assoc.* 57:655-667.
- Ackerman, J., and T. Riechen [1964]. "Development of Economic Criteria for Classifying Farms." *J. Farm Econ.* 46:1232-1237.
- Adelman, I., and Z. Griliches [1961]. "On an Index of Quality Change." *J. Am. Stat. Assoc.* 56:535-548.
- Aines, R. O. [1964]. "Farmland Valuation and Farm Programs." *J. Farm Econ.* 46:1253-1259.
- Allen, G., and M. Devers [1973]. *Livestock and Feed Relationships—National and State*. USDA Statistical Bulletin 530 (supersedes 446).
- Allen, G., and R. Mighell [1969]. *Urea Consumed by Cattle on Feed, Feeding Year 1965-66*. USDA Agricultural Economic Report 153.
- Allison, H. E., C. J. Zwick, and A. Brinser [1958]. "Menu Data and Their Contribution to Food Consumption Studies." *J. Farm Econ.* 40:1-20.
- American Agribusiness Associates [1973]. "New Agricultural Data System Needed." Washington, D.C. Mimeo.
- American Agricultural Economics Association, Committee on Economic Statistics [1972]. "Our Obsolete Data Systems: New Directions and Opportunities." *Am. J. Agr. Econ.* 54:867-880.
- American Bankers Association [monthly]. *Agricultural Banker*. See also the "Special Supplements" and "Special Reports" published in conjunction with the periodical.
- AFEA, Agricultural Data Committee [1957]. Unpublished report to USDA and Census Bureau.
- ASA, Advisory Committee [1948]. "The Employment Statistics Program of the BLS." *Am. Statistician* 2(2):21-22.
- ASA, Advisory Committee on Statistical Policy to the Bureau of the Budget [1953].

- "Statement of Principles with Respect to Direct Government Collection of Statistical Data." *Am. Statistician* 7(4):28, 33.
- ASA, Census Advisory Committee [1951]. "Report." *Am. Statistician* 5(3):10.
- ASA, Committee on Census Enumeration Areas [1954, 1955]. "Report." *Am. Statistician* 8(2):21, 10(2):16-17.
- Anderson, D. E., L. D. Loftsgard, and L. E. Erickson [1962]. *Characteristics and Changes of Land Ownership in North Dakota, 1945-1958*. North Dakota Agricultural Experiment Station Bulletin 438.
- Anderson, E. [1941]. *Per Capita Consumption of Foods, United States, 1909-39*. USDA, BAE. Mimeo.
- Andrelenas, P. [1974]. *Farmers' Use of Pesticides in 1971—Quantities*. USDA Agricultural Economic Report 252.
- Andrelenas, P., T. Eichers, and A. Fox [1967]. *Farmers' Expenditures for Pesticides in 1964*. USDA Agricultural Economic Report 106.
- Arkin, G. F., R. L. Vanderlip, and J. T. Ritchie [1976]. "A Dynamic Grain Sorghum Growth Model." *Transactions of the ASAE* 19:622-626.
- Arnold, C. J., and R. Barlowe [1954]. "The Journal of Farm Economics: Its First 35 Years." *J. Farm Econ.* 36:441-452.
- Arrow, K. J. [1974]. "Organization and Information." In *The Limits of Organization*. New York: Norton. Pp. 33-43.
- Askew, W. [1969]. "The Many Prices of Wheat." In *Wheat Situation*, USDA, ERS, WS-208, pp. 11-14.
- Bachman, K. L. [1958]. "Discussion: Better Basic Data for Agriculture." *J. Farm Econ.* 40:224-227.
- Bachman, K. L., J. C. Ellickson, W. D. Goodsell, and R. Hurley [1948]. "Appraisal of the Economic Classification of Farms." *J. Farm Econ.* 30:680-702.
- Backrock, S. D., and H. M. Scable [1967]. "Mailed Questionnaire Efficiency: Controlled Reduction of Non-response." *Public Opinion Quarterly* 31:265-276.
- Bailar, B. A. [1973]. "A Common Problem in Analysis of Panel Data." In *Abstracts Booklet*, ASA, p. 6.
- Bailar, B. A., and B. J. Tepping [1973]. "Enumerator Variance in the 1970 Census." In *Abstracts Booklet*, ASA, p. 127.
- Bailey, M. J., R. F. Muth, and H. O. Nourse [1963]. "A Regression Method for Real Estate Price Index Construction." *J. Am. Stat. Assoc.* 58:933-942.
- Bailey, W. R., and L. A. Jones [1970]. *Economic Considerations in Crop Insurance*. USDA ERS-447.
- Baker, O. E. [1929]. "Changes in Production and Consumption of Our Farm Products and the Trend in Population." In *Annals of the American Society of Political and Social Science*, March 1929 (reprint of 1925 publication).
- Ball, D. S., and J. W. Wilson [1968]. "Community Health Facilities and Services: The Manpower Dimensions." *Am. J. Agr. Econ.* 50:1208-1225.
- Ball, J., ed., and R. Gardella, compiler [1967]. *Foreign Statistical Documents*. Stanford University, Hoover Institution.
- Bancroft, T. A. [1972]. "The Statistical Community and the Protection of Privacy." *Am. Statistician* 26(4):13-16.
- Banks, M. J., and G. M. Shapiro [1971]. "Variances of the Current Population Survey, Including within and between PSU Components and the Effect of the Different Stages of Estimation." In *Abstracts Booklet*, ASA, pp. 5-6.

- Banks, V. J., and C. L. Beale [1973]. *Farm Population Estimates, 1910-1970*, USDA Statistical Bulletin No. 523.
- Banks, V. J., C. L. Beale, and G. K. Bowles [1963]. *Farm Population Estimates for 1910-62*. USDA, ERS-130.
- Barlowe, R., and R. D. Vlasin [1974]. "Indicators of Environmental Quality in the Use of Land Resources." Contributed paper presented at AAEA annual meeting, College Station, Texas.
- Barr, T. N., and H. F. Gale [1973]. "A Quarterly Forecasting Model for the Consumer Price Index for Food." *Agr. Econ. Res.* 25:1-14.
- Barton, G. T., and M. R. Cooper [1945]. *Farm Production in War and Peace*. USDA, BAE Farm Management Report 53.
- [1948]. "Relation of Agricultural Production to Inputs." *Rev. Econ. and Stat.* 30:117-126.
- Barton, G. T., and D. D. Durost [1960]. "The New USDA Index of Inputs." *J. Farm Econ.* 42:1398-1410.
- Bawden, D. L. [1971]. "Implications of a Negative Income Tax for Rural People." *Am. J. Agr. Econ.* 53:754-760.
- Bawden, D. L., and D. Kershaw [1973]. "Data on the Low Income Population of the U.S." Paper prepared for AAEA Task Force on Social and Economic Statistics.
- Bayton, J. A. [1950]. "Consumer Preference Work in the Department of Agriculture." *Agr. Econ. Res.* 2:105-112.
- Bean, L. H. [1930]. "Application of a Simplified Method of Correlation to Problems in Acreage and Yield Variations." *J. Am. Stat. Assoc.* 25:428-439.
- Beck, F. B. [1955]. "Making Existing Local Data More Available and Useful." *J. Farm Econ.* 37:1030-1037.
- Becker, J. A. [1951]. "Discussion: Agricultural Statistics." *J. Farm Econ.* 33:806-807.
- Becker, J. A., and C. L. Harlan [1939]. "Developments in Crops and Livestock Reporting since 1920." *J. Farm Econ.* 21:799-827.
- Been, R. O., K. Ogren, K. Parr, and B. Deloach [1945]. *Price Spreads between Farmers and Consumers for Food Products, 1913-1944; Supplement* (1947). USDA Miscellaneous Publication 576.
- Benedict, M. R. [1939]. "Development of Agricultural Statistics in the Bureau of the Census." *J. Farm Econ.* 21:735-760.
- Benedict, M. R., and G. M. Kuznets [1958]. "Better Basic Data for Agriculture: Some Possible Approaches." *J. Farm Econ.* 40:208-221.
- Benedict, M. R., H. R. Tolley, F. F. Elliott, and C. Taeuber [1944]. "Need for a New Classification of Farms." *J. Farm Econ.* 26:694-708.
- Bergmann, B. R. [1974]. "Have Economists Failed?" Presidential address to the Eastern Economic Association.
- Beringer, C. [1961]. *An Economic Model for Determining the Production Function for Water in Agriculture*. California Agricultural Experiment Station, Giannini Foundation Research Report 240.
- Berndt, E. R., and L. R. Christensen [1974]. "Testing for the Existence of a Consistent Aggregate Index of Labor Input." *Am. Econ. Rev.* 64:391-404.
- Bertrand, A. L., and F. L. Corty, eds. [1962]. *Rural Land Tenure in the United States: A Socio-Economic Approach to Problems, Programs and Trends*. Baton Rouge: Louisiana State University Press.
- Beverly, L. H. [1968]. *Status of Water and Sewage Facilities in Communities without Public Systems*. USDA Agricultural Economic Report 143.

- Beyer, G. H. [1965]. *Housing and Society*. New York: Macmillan.
- Beyer, G. H., and J. H. Rose [1957]. *Farm Housing*. New York: Wiley.
- Bhatia, K. B. [1971]. "The USDA Series on Net Investment in Farm Real Estate—A Critique." *J. Am. Stat. Assoc.* 66:492-495.
- Bird, A. R. [1964]. *Poverty in Rural Areas of the United States*. USDA Agricultural Economic Report 63.
- Bird, R. [1955]. "A Procedure for Estimating State General Sales Taxes Paid by the Farm Population." *Agr. Finance Rev.* 18:29-36.
- Bird, R. [1956]. *Taxes Levied on Farm Property in the United States and Methods of Estimating Them*. USDA Statistical Bulletin 189.
- Bird, R. [1973]. *Inadequate Housing and Poverty Status of Households, Areas Served by the Farmers Home Administration Programs, 1970, by States*. Rural Development Service. USDA Statistical Bulletin 520.
- Bird, R., L. Beverly, and A. Simmons [1968]. *Status of Rural Housing in the United States*. USDA Agricultural Economic Report 144.
- Bird, R., and N. Kegley [1971]. "Poor Housing Blights Our Countryside." In *A Good Life for More People—Yearbook of Agriculture, 1971*, USDA, pp. 72-75.
- Bird, R., and J. B. Perciful [1972]. *Housing Conditions in Areas Served by Farmers Home Administration Housing Programs, 1970*. USDA Statistical Bulletin 492.
- Birnbaum, A. [1962]. "Another View on the Foundations of Statistics." *Am. Statistician* 16(1):17-21.
- Bitting, H. W., and R. O. Rogers [1963]. "Utilization of Wheat for Food." *Agr. Econ. Res.* 15:61-69.
- Blackman, J. H. [1971]. "The Outlook for Economics." *Southern Econ. J.* 37:385-395.
- Blaney, H. F., and W. D. Criddle [1962]. *Determining Consumptive Use and Irrigation Water Requirements*. USDA Technical Bulletin 1275.
- Bodin, R. A. [1955]. "A Discussion from the Viewpoint of a State Agricultural Statistician." *J. Farm Econ.* 35:872-875.
- Boger, L. L. [1961]. "Economic Indicators in Agriculture—Praised and Appraised." *J. Farm Econ.* 43:430-439.
- [1966]. "Discussion: Changing Needs in a Changing Agriculture." *J. Farm Econ.* 48:1682-1686.
- Bolling, R. [1956]. "The Role of Statistics in Shaping Economic Policy." *Am. Statistician* 10(3):7-9.
- Bonnen, J. T. [1966]. "Rural Poverty: Programs and Problems." *J. Farm Econ.* 48:452-465.
- [1973]. "Statement before the Subcommittee on Census and Statistics." *1974 Census of Agriculture: Hearing of the Committee on Post Office and Civil Service*. House of Representatives, 93rd Congress, 1st Session, pp. 2-6 and 116-125.
- [1975]. "Improving Information on Agriculture and Rural Life." *Am. J. Agr. Econ.* 57:753-763.
- [1976]. "An Information System Approach to National Agricultural Data Collection, Analysis and Decision." Paper presented at workshop, Minimum Information Systems for Agricultural Development in Low Income Countries, Oxford, England, December 6-9; to be published by the Agricultural Development Council.
- [1977]. "Assessment of the Current Data Base for Agricultural Decision Makers: An Information System Approach." (See the table of contents in this volume.)

- Borum, C. J. [1951]. "Estimating Flood Damage to the Bean Crop in Michigan." *Agr. Econ. Res.* 3:16-17.
- [1955]. "Discussion: New Data Requirements by Areas—How Can They Be Met?" *J. Farm Econ.* 37:1056-1057.
- Bosecker, R. R., and B. L. Ford [1976]. "Multiple Frame Estimation with Stratified Overlap Domain." In *Abstracts Booklet*, ASA, p. 19.
- Bottom, J. C., and J. Ackerman [1958]. "Current and Area Data Progress and Future Needs in the United States." *J. Farm Econ.* 40:1772-1778.
- Bowman, R. T. [1968]. "Crossroad Choices for the Future Development of the Federal Statistical System." *J. Am. Stat. Assoc.* 63:801-816.
- Bowman, R. T., and M. E. Martin [1962]. "Special Report on Unemployment Statistics: Meaning and Measurement." *Am. Statistician* 16(4):14-22.
- Boxley, R. F. [1971]. "Farm Size and the Distribution of Farm Numbers." *Agr. Econ. Res.* 23:87-94.
- Boxley, R. F., Jr., W. L. Gibson, Jr., and B. R. Hoffnar [1964]. "The Application of Probability Theory Analysis to Nonrandom Enumeration Data." *J. Farm Econ.* 46:835-840.
- Boyne, D. H. [1964]. *Changes in the Real Wealth Position of Farm Operators, 1940-1960*. Michigan Agricultural Experiment Station Technical Bulletin 294.
- Brake, J. R. [1974]. "Farm Finance and National Economic Policy—Some Gaps in Knowledge." *Am. J. Agr. Econ.* 56:1056-1062.
- Brake, J. R., and P. J. Barry [1971]. "Flow-of-Funds Social Accounts for the Farm Sector: Comment." *Am. J. Agr. Econ.* 53:665-668.
- Brandow, G. E. [1976]. *Review and Evaluation of Price Spread Data for Foods*. Report of a task force (G. E. Brandow, chairman), sponsored by the Economic Statistics Committee of the AAEA and by the ERS.
- Breimyer, H. F. [1967]. "This is Market News." *Agr. Marketing* (February), 12:8, 9, 13.
- [1968]. "'Realized' Farm Income: An Outmoded Concept? Comment." *Am. J. Agr. Econ.* 50:432-434.
- Brooks, E. M. [1949]. "The General Enumerative Surveys." *Agr. Econ. Res.* 1:37-47.
- Brooks, R. M., V. D. Ryan, B. F. Blake, and J. R. Gordon [1974]. *An Explanation and Appraisal of the Methodology Used in the 1973 Indiana Community Preference Study: A Mail Survey*. Purdue University Agricultural Experiment Station Bulletin 53.
- Brown, J. D. [1969]. "Effect of a Health Hazard 'Scare' on Consumer Demand." *Am. J. Agr. Econ.* 51:676-678.
- Bryant, W. K. [1973]. "The Rising Value of Time and the Demand for Social and Economic Statistics." Paper prepared for AAEA Task Force on Social and Economic Statistics.
- Budd, E. C. [1971]. "The Creation of a Microdata File for Estimating the Size Distribution of Income." *Review of Income and Wealth* 17:317-333.
- Bullock, J. B. [1976]. "Social Costs Caused by Errors in Agricultural Production Forecasts." *Am. J. Agr. Econ.* 58:76-80.
- Burk, M. C. [1956]. "Studies of the Consumption of Food and Their Uses." *J. Farm Econ.* 38:1736-1746.
- [1959]. "The Study of Regional Food Consumption." *J. Farm Econ.* 41:1040-1049.

- [1968]. *Consumption Economics: A Multidisciplinary Approach*. New York: Wiley.
- Burk, M. C., and T. J. Lanahan, Jr. [1958]. "Use of 1955 Food Survey for Research in Agricultural Economics." *Agr. Econ. Res.* 10:79-99.
- Burnham, B. O., and T. L. Jones [1969]. *Housing Costs: Rural-Urban Comparisons*. Ohio Agricultural Research Bulletin 1022.
- Burroughs, R. J. [1949]. "Uses and Misuses of the Balance Sheet of Agriculture." *Agr. Finance Rev.* 12:22-32.
- [1950]. "Balance Sheet of Agriculture—Meaning, Conceptual Limitations, and Uses." *Agr. Econ. Res.* 2:86-95.
- Buse, R. C. [1973]. "Increasing Response Rates in Mailed Questionnaires." *Am. J. Agr. Econ.* 55:503-508.
- Butz, D. E. [1966]. "Needs of the Agribusiness Community." *J. Farm Econ.* 48:1175-1178.
- Callander, W. F. [1949]. "Letter to the Editor—The Agricultural Statisticians and the Program of the A.S.A." *Am. Statistician* 3(4):1.
- Callander, W. F., and C. F. Sarle [1947]. "The BAE Program in Enumerative Sampling." *J. Farm Econ.* 29:233-236.
- Carlin, T. A., and C. R. Handy [1974]. "Concepts of the Agricultural Economy and Economic Accounting." *Am. J. Agr. Econ.* 56:964-975.
- Carlin, T. A., and A. G. Smith [1973]. "A New Approach in Accounting for Our Nation's Farm Income." *Agr. Finance Rev.* 34:1-6.
- Carter, H. O., and E. O. Heady [1959]. *An Input-Output Analysis Emphasizing Regional and Commodity Sectors of Agriculture*. Iowa Agricultural Experiment Station Bulletin 469.
- Caudill, C. E. [1965]. "Joint Use of Different Sampling Frames." *J. Farm Econ.* 47:1534-1539.
- Cavin, J. P. [1952]. "Forecasting the Demand for Agricultural Products." *Agr. Econ. Res.* 4:65-76.
- Christensen, L. R. [1975]. "Concepts and Measurement of Agricultural Productivity." *Am. J. Agr. Econ.* 57:910-915.
- Christensen, L. R., and D. W. Jorgenson [1973]. "Measuring the Performance of the Private Sector of the U.S. Economy, 1929-1969." In *Measuring Economic and Social Performance*, M. Moss, ed. National Bureau of Economic Research.
- Christensen, L. R., and M. E. Manser [1975]. "Cost of Living Indexes and Price Indexes for U.S. Meat and Produce, 1947-71." In *Household Production and Consumption*, N. Terleckyj, ed. National Bureau of Economic Research.
- Churchman, C. W. [1971]. *The Design of Inquiring Systems*. New York: Basic Books.
- Chryst, W. E. [1965]. "Land Values and Agricultural Income: A Paradox?" *J. Farm Econ.* 47:1265-1273.
- Ciancio, N. J., and R. D. Tortora [1976]. "On Unbiased Estimation in the Area and List Frame." In *Abstracts Booklet*, ASA, p. 28.
- CIDA (Inter-American Committee for Agricultural Development) [1963]. *Inventory of Information Basic to the Planning of Agricultural Development in Latin America—Regional Report*. Washington: Pan American Union. Reviewed by R. G. Wheeler in *J. Farm Econ.* 46:872-873.
- Clark, F., B. Friend, and M. C. Burk [1947]. *Nutritive Value of the Per Capita Food Supply, 1909-45*. USDA Miscellaneous Publication 616.

- Clausen, J. A., and R. M. Ford [1957]. "Controlling Bias in Mail Questionnaires." *J. Am. Stat. Assoc.* 42:449.
- Clawson, M. [1966]. "Recent Efforts to Improve Land Use Information." *J. Am. Stat. Assoc.* 61:647-657.
- [1967]. "Rural Poverty in the United States." *J. Farm Econ.* 49:1227-1234.
- Clawson, M., and C. L. Stewart [1965]. *Land Use Information: A Critical Survey of U.S. Statistics Including Possibilities for Greater Uniformity*. Washington, D.C.: Resources for the Future.
- Clough, M. [1951]. "Changes in Corn Acreage and Production after the Early Indications." *Agr. Econ. Res.* 3:140-146.
- Cochran, W. G. [1953]. *Sampling Techniques*. New York: Wiley.
- Cochrane, R. S. [1965]. "Multiple Frame Sample Surveys." *J. Am. Stat. Assoc.* 60: 656(abstract).
- Cochrane, W. W. [1961]. "The Role of Economics and Statistics in the USDA." *Agr. Econ. Res.* 13:69-74.
- [1966]. "Improvements Needed in Statistics for Making Policy and Program Decisions." *J. Farm Econ.* 48:1654-1666.
- Cohen, M. R., and E. Nagel [1934]. *An Introduction to Logic and the Scientific Method*. New York: Harcourt Brace.
- Commons, J. R. [1924]. *The Legal Foundations of Capitalism*. New York: Macmillan.
- Conklin, M. J., and R. C. McElroy [1966]. *A Survey of Migrant Farmworker Housing in Oregon*. Oregon Agricultural Experiment Station Bulletin 602.
- Cook, R. N., and J. L. Kennedy, eds. [1966]. *Proceedings of the Tri-State Conference on a Comprehensive, Unified Land Data System (CULDATA)*. University of Cincinnati College of Law.
- Cooper, M. R., G. T. Barton, and A. P. Brodell [1947]. *Progress of Farm Mechanization*. USDA Miscellaneous Bulletin 630.
- Cox, E. B. [1962]. "Henry Moore and the 'Statistical Complement of Pure Economics.'" *Am. Statistician* 16(2):10-13.
- Crawford, T. L. [1974]. "The Bill for Marketing U.S. Farm-Food Products." In *Marketing and Transportation Situation*, USDA, ERS, MTS-194, pp. 15-30.
- Crecink, J. C., and H. Hoover [1960]. *Incomes and Resources of Rural Families in the Clay Hills Area of Mississippi*. Mississippi Agricultural Experiment Station Bulletin 604.
- Crecink, J. C., and R. Steptoe [1970]. *Human Resources in the Rural Mississippi Delta, with Emphasis on the Poor*. USDA Agricultural Economic Report 170.
- Crom, R. J. [1972]. "Economic Projections Using Behavioral Models." *Agr. Econ. Res.* 24:9-15.
- Cromarty, W. A. [1959]. "An Econometric Model for United States Agriculture." *J. Am. Stat. Assoc.* 54:556-574.
- Crosswhite, M., and G. Vaughn [1962]. *Land Use in the Rural-Urban Fringe: A Case Study of Newcastle County, Delaware*. Delaware Agricultural Experiment Station Bulletin 340.
- Crowley, W., Jr. [1972]. *The Influence of Net Real Estate Income and Other Property Characteristics on Prices of Agricultural Properties within and among Selected Areas of Oregon, 1965-69*. Unpublished Ph.D. dissertation, Oregon State University.
- Daft, L. [1973]. "Rural Area Public Policy: Some Implications for Social and Economic Statistics." Paper prepared for AAEE Task Force on Social and Economic Statistics.

- Daly, R. F. [1957]. "Prospective Demands for Food and Fiber." *Policy for Commercial Agriculture: Its Relations to Economic Growth and Stability*. Joint Economic Committee, 85th U.S. Congress, 1st Session.
- [1963]. "Long-Run Economic Projections: A Review and Appraisal." *Agr. Econ. Res.* 15:113-121.
- [1966]. "Current Questions on National Agricultural Outlook." *J. Farm Econ.* 48:1167-1174.
- [1969]. "Effective Use of Available Data." Paper presented at the National Marketing Service Workshop, Asheville, N.C.
- Darr, D. R. [1972]. *Production, Prices, Employment and Trade in the Northwest Forest Industries, Fourth Quarter 1971*. USDA, Forest Service, Pacific Northwest Forest and Range Experiment Station.
- David, M. [1976]. "Strategies for Improving Policy-Relevant Data on the Poor." *Am. Statistician* 30:129-133.
- Davis, W. D., Jr., and F. Miller [1959]. *Land Price Trends in Missouri*. Missouri Agricultural Experiment Station Research Bulletin 686.
- De Leeuw, F. [1962]. "The Concept of Capacity." *J. Am. Stat. Assoc.* 58:826-840.
- Demsetz, H. [1969]. "Information and Efficiency: Another Viewpoint." *J. Law Econ.* 12:1-22.
- Denison, E. F. [1969]. "Some Major Issues in Productivity Analysis: An Examination of Estimates by Jorgenson and Griliches." *Survey of Current Business* 49(5):1-27 (part 2); reprinted in 1972 in *Survey of Current Business* 52(5):37-63 (part 2).
- Dewey, J. [1938]. *Logic, the Theory of Inquiry*. New York: Holt.
- Dill, H. W., Jr. [1955]. "Photo Interpretation in Flood Control Appraisal." *Photogrammetric Engineering* 21:112-114.
- [1967]. *Worldwide Use of Airphotos in Agriculture*. USDA Agriculture Handbook 344.
- Dill, H. W., Jr., and R. C. Otte [1970]. *Urbanization of Land in the Western States*. USDA, ERS Report 428.
- [1971]. *Urbanization of Land in the Northeastern United States*. USDA, ERS Report 485.
- Dovring, F., and W. H. Scofield [1963]. *Farm Real Estate Sales in Illinois*. Illinois Agricultural Experiment Station Bulletin 697.
- Doyle, Sir Arthur Conan [1930]. "The Adventures of Sherlock Holmes: A Scandal in Bohemia." In *The Complete Sherlock Holmes*. New York: Doubleday. P. 163.
- Ducock, L. J., and G. Bancroft [1945]. "Experiment in the Measurement of Unpaid Family Labor in Agriculture." *J. Am. Stat. Assoc.* 40:205-213.
- Ducock, L. J., and M. J. Hagood [1946]. "Objectives, Uses and Types of Labor Force Data in Relation to Economic Policy." *J. Am. Stat. Assoc.* 41:293-302.
- [1947]. *Labor Force Definition and Measurement*. Social Science Research Council Bulletin 56.
- Dunn, E. S., Jr. [1966]. "Review of Proposals for a National Data Center." *The Computer and the Invasion of Privacy*. Hearings of the Subcommittee, Committee on Government Operations, House of Representatives, 89th Congress, 2nd Session.
- [1971]. "The National Economic Accounts: A Case Study of the Evolution toward Integrated Statistical Information Systems." *Survey of Current Business* 51(7):45-64 (part 2).
- [1974]. *Social Information Processing and Statistical Systems—Change and Reform*. New York: Wiley.

- Durost, D. D. [1960]. *Index Numbers of Agricultural Production by Regions, 1939-1958*. USDA Statistical Bulletin 273.
- Durost, D. D., and G. T. Barton [1960]. *Changing Sources of Farm Output*. USDA, ARS Production Research Report 36.
- Dwoskin, P. B., and M. Jacobs [1957]. *Potato Flakes—A New Form of Dehydrated Mashed Potatoes: Market Position and Consumer Acceptance in Binghamton, Endicott and Johnson City, N.Y.* USDA Marketing Research Report 186.
- Dyer, D. R. [1975]. "Livestock Capital Formation—A Preliminary Report." *Western Agr. Econ. Assoc. Proceedings*, July, pp. 226-229.
- Ebling, W. H. [1939]. "Why the Government Entered the Field of Crop Reporting and Forecasting." *J. Farm Econ.* 21:718-734.
- Ebling, W. H., and H. L. Ahlgren [1954]. "Agricultural Data Requirements—National, State, and County." *J. Farm Econ.* 36:1226-1239.
- [1959]. "Some Needed Developments in Statistical Programs to Obtain Research Data." *J. Farm Econ.* 41:1506-1518.
- Eckler, R., and C. Taeuber [1954]. "The Current Statistics of the Census Bureau." *J. Am. Stat. Assoc.* 49:348 (abstract).
- Edgington, E. S. [1963]. "Joint Analysis of Differences in Central Tendency and Variability." *Am. Statistician* 17(3):28-30.
- Edwards, A. D., and D. G. Jones [1964]. *Housing in South Carolina: Its Socio-economic Context*. South Carolina Agricultural Experiment Station Bulletin 511.
- Edwards, C. [1969]. "A Rural Economic Indicator System." *J. Farm Econ.* 51:1202-1205.
- [1973]. "Local Economic Development." Paper prepared for AAEE Task Force on Social and Economic Statistics.
- Egbert, A. C. [1969]. "An Aggregate Model of Agriculture: Empirical Estimates and Some Policy Implications." *Am. J. Agr. Econ.* 51:71-86.
- Ehlers, W. F. [1960]. "Economic Implications of Drought Probabilities for Humid Area Irrigation." *J. Farm Econ.* 42:1518-1519.
- Eisgruber, L. M. [1967]. "Micro- and Macro-analytic Potential of Agricultural Information Systems." *J. Farm Econ.* 49:1541-1552.
- [1973]. "Managerial Information and Decision Systems in the U.S.A.: Historical Developments, Current Status, and Major Issues." *Am. J. Agr. Econ.* 55:930-939.
- Eley, C. [1971]. "Cost of Packaging Materials for Farm Foods." In *Marketing and Transportation Situation*, USDA, ERS, MTS-182, pp. 17-20.
- Elrod, R. H., and P. E. LaFerney [1970]. *Sector Income and Employment Multipliers: Their Interactions on the National Economy*. USDA Technical Bulletin 1421.
- Erickson, C. E. [1971]. "Adequacy of Economic Statistics for Agribusiness Planning." *Am. J. Agr. Econ.* 53:912 (abstract).
- Evans, J. A., and W. F. Hughes [1971]. *Production Costs, Resource Returns, and Other Economic Characteristics—Commercial Cotton Farms, Southern High Plains, Texas, 1966-69*. USDA, ERS Report 478.
- Ewing, J. A. [1956]. "Discussion: Local Data Requirements in Areas of High Agricultural Specialization." *J. Farm Econ.* 38:1471-1474.
- Ezekiel, M. [1924]. "A Method of Handling Curvilinear Correlation for Any Number of Variables." *J. Am. Stat. Assoc.* 19:431-453.
- Fabricant, S. [1959]. *Basic Facts on Productivity Change*. National Bureau of Economic Research, Occasional Paper 63.

- Fellegi, I. P. [1972]. "On the Question of Statistical Confidentiality." *J. Am. Stat. Assoc.* 67:7-18.
- Fellegi, I. P., and K. J. Krotki [1968]. "The Testing Programs for the 1971 Census in Canada." *J. Am. Stat. Assoc.* 63:750-751 (abstract).
- Ferber, R. [1949]. *Statistical Techniques in Market Research*. New York: McGraw-Hill.
- [1955]. "On the Reliability of Responses Secured in Sample Surveys." *J. Am. Stat. Assoc.* 50:788-810.
- [1956]. "On the Interpretation of the Aggregate Savings Ratio." *Am. Statistician* 10(3):10-13.
- [1966]. "Item Non-response in a Consumer Survey." *Public Opinion Quarterly* 30:399-413.
- Ferguson, R. H., and N. P. Kingsley [1972]. *The Timber Resources of Maine*. USDA, Northeastern Forest Research Experiment Station, Resource Bulletin NE-26.
- Ferris, J. [1962]. "Unsolved Problems in Data Collection and Analysis." *J. Farm Econ.* 44:1763-1772.
- Finkner, A. L. [1952]. "Adjustment for Non-response Bias in a Rural Mailed Survey." *Agr. Econ. Res.* 4:77-82.
- Fischer, L. K., R. Burkholder, and J. Muehlbeier [1960]. *The Farm Real Estate Market in Nebraska*. Nebraska Agricultural Experiment Station Bulletin SB-456.
- Fisher, J. L., and N. Potter [1964]. *World Prospects for Natural Resources: Some Projections of Demand and Indicators of Supply to the Year 2000*. Baltimore: Johns Hopkins University Press.
- Foote, R. J. [1970]. *Concepts Involved in Defining and Identifying Farms*. USDA, ERS Report 448.
- Foote, R. J., and L. H. Bean [1951]. "Are Yearly Variations in Crop Yield Really Random?" *Agr. Econ. Res.* 3:23-30.
- Foote, R. J., and K. A. Fox [1952]. *Seasonal Variation: Methods of Measurement and Tests of Significance*. USDA Agriculture Handbook 48.
- Foote, R. J., and H. Weingarten [1958]. "Alternative Methods for Estimating Changes in Production from Data on Acreage and Condition." *Agr. Econ. Res.* 10:20-27.
- Fox, A., T. Eichers, P. Andrelenas, R. Jenkins, and H. Blake [1968]. *Extent of Farm Pesticide Use on Crops in 1966*. USDA Agricultural Economic Report 147.
- Fox, K. A. [1953]. "Factors Affecting the Accuracy of Price Forecasts." *J. Farm Econ.* 35:323-340.
- Freeman, R. E. [1970]. *Rural Housing: Trends and Prospects*. USDA Agricultural Economic Report 193.
- Freeman, R. E., and D. D. Miller [1970]. "National Goals for Housing." In *A Good Life for More People*, USDA Yearbook of Agriculture.
- French, C. E., and D. C. Kranz [1957]. "Telephone Interview as a Means of Surveying Farmers." *J. Farm Econ.* 39:153-155.
- Frey, H. T. [1967]. *Agricultural Application of Remote Sensing—The Potential from Space Platforms*. USDA Agriculture Information Bulletin 328.
- Frey, H. T., and H. W. Dill, Jr. [1971]. *Land Use Change in the Southern Mississippi Alluvial Valley, 1950-69: An Analysis Based on Remote Sensing*. USDA Agricultural Economic Report 215.
- Frey, H. T., O. K. Krause, and C. Dickason [1968]. *Major Uses of Land and Water in the United States with Special Reference to Agriculture: Summary for 1964*. USDA Agricultural Economic Report 149.

- Friend, B. [1963]. "Enrichment and Fortification of Foods." In *National Food Situation*, USDA, ERS, NFS-106, pp. 36-40.
- Fritsch, C., et al. [1975]. "Task Force Report: A Working Definition of the Food and Fiber System." USDA, ERS. Mimeo.
- Fromm, G. [1973]. "Implications to and from Economic Theory in Models of Complex Systems." *Am. J. Agr. Econ.* 55:259-270.
- Frye, R. E. [1962]. *Effect of the Pilot Food Stamp Program on Retail Food Store Sales*. USDA Agricultural Economic Report 8.
- Fuller, V., R. Gillett, E. Heady, P. Homeyer, D. G. Johnson [1953]. "Report of the AFEA Committee on Farm Employment Estimates." *J. Farm Econ.* 35:976-987; W. A. Hendricks, "Discussion," p. 988.
- Fuller, V., and W. Van Vuuren [undated]. "Farm Labor and Labor Markets." University of California (Davis), Department of Agricultural Economics. Mimeo.
- Gabbard, L. P., and R. G. Cherry [1948]. *Trend of Taxes on Farm and Ranch Real Estate in Texas, 1890-1946*. Texas Agricultural Experiment Station Bulletin 702.
- Gale, H. F. [1967]. *The Farm Food Marketing Bill and Its Components*. USDA Agricultural Economic Report 105.
- [1968]. "Industry Output, Labor, Input, Value Added and Productivity Associated with Food Expenditures." *Agr. Econ. Res.* 20:113-133.
- Gardner, B. [1973]. "Human Resource Statistics for Rural Areas." Paper prepared for AAEA Task Force on Social and Economic Statistics.
- [1975]. "Strategies for Long-Run Investment in Rural, Social, and Economic Statistics." *Am. J. Agr. Econ.* 57:892-899.
- Garlock, F., and P. Allen [1964]. *Technical Appraisal of the 1960 Sample Survey of Farm Debt*. USDA, ERS Report 167.
- Gertel, K. [1962a]. "Water Data for Economic Decisions." International Seminar on Water and Soil Utilization, Brookings, S.D., July 18-August 10.
- [1962b]. *Water: Uses, Supplies, Projections—An Introduction to Terms and Reference Sources*. USDA, ERS.
- Gibson, W. L., Jr., C. J. Arnold, and F. D. Aigner [1962]. *The Marginal Value of Flue-Cured Tobacco Allotments*. Virginia Agricultural Experiment Station Technical Bulletin 156.
- Gibson, W. L., Jr., and R. L. Chambliss, Jr. [1966]. "Peanut Allotments and the Price of Farm Land." *Virginia Farm Economics*, No. 196, Virginia Polytechnic Institute.
- Gilbert, E. N. [1958]. "An Outline of Information Theory." *Am. Statistician* 12(1):13-19.
- Gilbert, S. J. [1955]. "Discussion: Needed Changes in State and Local Crop and Livestock Reports." *J. Farm Econ.* 37:1058-1059.
- Gillett, R. L. [1948]. "Data Needs for Agricultural Research and Marketing." *J. Farm Econ.* 30:271-281.
- Gilliam, H. C., Jr., and J. W. Hubbard [1971]. *An Analysis of Agricultural Land Values in Selected Cotton Producing Counties of the South Carolina Coastal Plain*. South Carolina Agricultural Experiment Station Bulletin 554.
- Gomme, F. R. [1972]. "Buckwheat: A Look at Its Prospects and Problems." In *Wheat Situation*, USDA, ERS, WS-220, pp. 9-11.
- Gonzalez, M. E. [1973]. "Use and Evaluation of Synthetic Estimates." In *Abstracts Booklet*, ASA, pp. 41-42.
- Goodsell, W. D. [1956]. *Costs and Returns: Commercial Family-Operated Farms by Type and Size, 1930-1951*. USDA Statistical Bulletin 197.
- Goodsell, W. D., W. H. Brown, H. C. Fowler, E. Hole, E. B. Hurd, Jr., J. Vermeer, and I.

- Jenkins [1956]. *Farm Costs and Returns, 1955 (with Comparisons): Commercial Family-Operated Farms, by Type and Location*. USDA Agriculture Information Bulletin 158.
- Grange, G. R. [1967]. "The Changing Face of Market News." *Agr. Marketing* 12:4, 5, 13.
- [1972]. "The Federal-State Market News Service." *Major Statistical Series of the U.S. Department of Agriculture—How They Are Constructed and Used, Volume 10, Market News*. USDA Agriculture Handbook 365, pp. 1-7.
- Grieves, H. C. [1954]. "'Spot Checks' in Lieu of Complete Censuses." *J. Am. Stat. Assoc.* 49:347 (abstract).
- Griliches, Z. [1960]. "Measuring Inputs in Agriculture: A Critical Survey." *J. Farm Econ.* 42:1411-1427.
- [1963]. "The Sources of Measured Productivity Growth, U.S. Agriculture, 1940-60." *J. Pol. Econ.* 71:331-346.
- Grove, E. W. [1939]. "Farm Population, Nonfarm Population, and Number of Farms in the United States, 1910-1939: Section I, Population, Farming, and Farmers." In *Income Parity for Agriculture*, part 5, USDA, BAE. Mimeo.
- [1954]. "Quarterly Estimates of Realized Gross and Net Farm Income." *Agr. Econ. Res.* 6:65-76.
- [1967]. "Realized Farm Income: An Outmoded Concept?" *J. Farm Econ.* 49: 795-805.
- [1969]. "Econometricians and the Data Gap: Comment." *Am. J. Agr. Econ.* 51:184-188.
- Guither, H. D. [1970]. *Needs and Preferences for Grain Market News among Illinois Farm Operators*. University of Illinois Agricultural Experiment Station AERR-103.
- Gunnels, G., W. D. Dobson, and S. Pamperin [1972]. "Analysis of the Accuracy of USDA Crop Forecasts." *Am. J. Agr. Econ.* 54:639-645.
- Haavelmo, T. [1947]. "The Interdependence between Agriculture and the National Economy." *J. Farm Econ.* 29:910-923.
- Hady, T. F. [1970]. "Differential Assessment of Farmland on the Rural-Urban Fringe." *Am. J. Agr. Econ.* 52:25-32.
- Hady, T. F., and T. F. Stinson [1967]. *Taxation of Farmland on the Rural-Urban Fringe*. USDA Agricultural Economic Report 119.
- Hagood, M. J. [1945]. *General Purpose Sample Survey*. USDA, BAE. Processed Report.
- Hagood, M. J., and E. H. Bernert [1945]. "Component Indexes as a Basis for Stratification in Sampling." *J. Am. Stat. Assoc.* 40:330-341.
- Hahn, F. H. [1970]. "Some Adjustment Problems." *Econometrica* 38:1-17.
- Hair, D., and A. H. Ulrich [1971]. *The Demand and Price Situation for Forest Products, 1970-71*. USDA Miscellaneous Publication 1195.
- Halcrow, H. G., and T. A. Hieronymus [1959]. "Parity Prices in their Economic Context." *J. Farm Econ.* 41:1289-1299, 1300.
- Hale, R. F. [1939]. "Estimating Local Market Prices and Farm Labor since 1920." *J. Farm Econ.* 21:828-837.
- Hall, G. E. [1969]. "Recent Experiences in the Collection of Longitudinal Survey Data." *J. Am. Stat. Assoc.* 64:696 (abstract).
- Hamlin, E. T. [1970]. *Financing of Rural Nonfarm Housing in the United States*. USDA, ERS.

- Hansen, M. H. [1965]. "Some New Developments Increasing the Availability of Census Information." *J. Am. Stat. Assoc.* 60:662 (abstract).
- Hansen, M. H., and W. N. Hurwitz [1946]. "The Problem of Non-response in Sample Surveys." *J. Am. Stat. Assoc.* 41:517-528.
- Hansen, H., W. N. Hurwitz, and W. G. Madow [1953]. *Sample Survey Methods and Theory*. New York: Wiley.
- Hardin, C. M. [1946]. "The BAE under Fire: A Study in Valuation Conflicts." *J. Farm Econ.* 28:635-668.
- Haren, C. C. [1975]. "Today's Metropolitan Areas: The Need for Critical Reevaluation." In *Abstracts Booklet*, ASA, p. 61.
- Harlan, C. L. [1947]. "The 1945 Census Enumeration of Livestock on Farms." *J. Farm Econ.* 29:691-710.
- Harp, H. H., and D. F. Dunham [1963]. *Comparative Costs to Consumers of Convenience Foods and Home Prepared Foods*. USDA Marketing Research Report 609.
- Harris, C. C., Jr. [1962]. "Parity Income Prices." *J. Farm Econ.* 44:141-156.
- Hartley, H. O. [1962]. "Multiple Frame Surveys." Paper given at the Minneapolis meetings of the ASA.
- [1965]. "Discussion, Sampling Frames for Collection of Agricultural Statistics." *J. Farm Econ.* 47:1542-1544.
- Hartnett, H. B. [1965]. *Marketing Economics Research Publications*. USDA, ERS Report 205.
- Hathaway, D. E. [1955]. *The Effects of the Price Support Program on the Dry Bean Industry in Michigan*. Michigan Agricultural Experiment Station Technical Bulletin 250.
- [1959]. "Discussion: Supplemental Data from the Forthcoming Censuses." *J. Farm Econ.* 41:1503-1505.
- [1963]. "Improving and Extending Farm-Nonfarm Income Comparisons." *J. Farm Econ.* 45:367-375.
- [1969]. "The Economics of Agricultural Economics." *Am. J. Agr. Econ.* 51:1011-1026.
- [1972]. "Some Special Characteristics of Rural Areas." In *Labor Market Information in Rural Areas*. Center for Rural Manpower and Public Affairs, Michigan State University.
- Hathaway, D. E., J. A. Beegle, and W. K. Bryant [1968]. *People of Rural America*. 1960 Census Monograph, U.S. Bureau of the Census, Washington, D.C.
- Hayek, F. A. [1945]. "The Use of Knowledge in Society." *Am. Econ. Rev.* 35:519-530.
- Hayami, Y., and W. Peterson [1972]. "Social Returns to Public Information Services: Statistical Reporting of U.S. Farm Commodities." *Am. Econ. Rev.* 62:119-130.
- Hayenga, M. L. [1971]. "Hog Pricing and Evaluation Methods—Their Accuracy and Equity." *Am. J. Agr. Econ.* 53:506-509.
- Heady, E. O., and L. Auer [1966]. "Imputation of Production to Technologies." *J. Farm Econ.* 48:309-322.
- Heady, E. O., and L. G. Tweeten [1963]. *Resource Demand and Structure of the Agricultural Industry*. Ames: Iowa State University Press.
- Heflebower, R. B. [1951]. "An Economic Appraisal of Price Measures." *J. Am. Stat. Assoc.* 46:461-479.
- Hein, C. J. [1960]. "The Function and Finances of Special Districts in Rural Areas." *Agr. Finance Rev.* 22:1-19.

- Henderson, H. A. [1960]. *Resources and Incomes of Rural East Tennessee People*. Tennessee Agricultural Experiment Station Bulletin 312.
- Hendricks, W. A. [1947]. "Farm Employment Levels in Relation to Supply and Demand as Per Cent of Normal." *J. Am. Stat. Assoc.* 42:271-281.
- [1949]. "Adjustment for Bias by Non-response in Mailed Surveys." *Agr. Econ. Res.* 1:52-56.
- [1955]. "Validity of Objective Estimates of Corn Yield." *Agr. Econ. Res.* 7: 69-72.
- [1963]. "Forecasting Yields with Objective Measurements." *J. Farm Econ.* 45: 1508-1513.
- Hendricks, W. A., and H. F. Huddleston [1955]. "A Foundation for Objective Forecasts of Cotton Yields." *Agr. Econ. Res.* 7:108-111.
- Hendricks, W. A., D. T. Searls, and D. G. Horvitz [1964]. "A Comparison of Three Rules for Associating Farms and Farmland with Sample Area Segments in Agricultural Surveys." *J. Am. Stat. Assoc.* 59:588 (abstract).
- Hendrix, W. E. [1955]. "The Low Income Problem in American Agriculture." In *United States Agriculture: Perspectives and Prospects*. The American Assembly, Graduate School of Business, Columbia University. Pp. 84-101.
- Heneberry, W. H., and R. Barlowe [1962]. *Assessment of Farm Real Estate for Property Taxes*. Michigan Agricultural Experiment Station Special Bulletin 439.
- Herd, R. W., and W. W. Cochran [1966]. "Farm Land Prices and Technological Advance." *J. Farm Econ.* 48:243-263.
- Herriot, R., and E. Spiers [1975]. "Measuring the Impact on Family Income Statistics of Reporting Differences between the CPS and Administrative Sources." In *Abstracts Booklet*, ASA, p. 65.
- Hickman, B. G. [1964]. "On a New Method of Capacity Estimation." *J. Am. Stat. Assoc.* 59:529-549.
- Hiemstra, S. J. [1968]. *Food Consumption, Prices and Explanations*. USDA Agricultural Economic Report 138 (also *Supplements* for 1968, 1970, 1971, 1972, and 1973, all bearing the same report number).
- Hildreth, R. J. [1967]. "Discussion: Comprehensive Agricultural Data Systems." *J. Farm Econ.* 49:1558-1560.
- [1975]. *Report of Task Force on Farm Income Estimates*. Report of a task force (R. J. Hildreth, chairman), sponsored by the Economic Statistics Committee of the AAEA and by the ERS.
- Hildreth, R. J., and G. Worden [1976]. "Revisions of Statistical Definitions: What Is a Farm?" In *Proceedings, American Statistical Association, Social Statistics Section*, part I, pp. 42-46.
- Hirsch, H. G. [1947]. "1950 World Census of Agriculture." *J. Farm Econ.* 29:564-566.
- Hirshleifer, J. [1971]. "The Private and Social Value of Information and the Reward to Inventive Activity." *Am. Econ. Rev.* 61:561-573.
- Hoag, H. M. [1970]. *The Use and Need for Livestock Market News: Part II, Personal Interview Survey*. Southern Illinois University, School of Agriculture Publication 34.
- Hoffman, A. C. [1966]. "Discussion: Agricultural Economics in the USDA." *J. Farm Econ.* 48:436-439.
- Holmes, A. D. [1951]. "Sampling for Agricultural Statistics in Canada." *J. Farm Econ.* 33:780-786.

- Holmes, O. W. [1969]. "The Farm Poor: Counted, Miscalculated, or Discounted?" *J. Farm Econ.* 51:1557-1560.
- Hoover, H., and B. L. Green [1970]. *Human Resources in the Rural Ozarks Region, with Emphasis on the Poor*. USDA Agricultural Economic Report 182.
- Horring, J. [1961]. *Concepts of Productivity Measurement in Agriculture on a National Scale*. OECD Documentation in Food and Agriculture 57, Paris.
- Hotelling, H. [1958]. "The Statistical Method and the Philosophy of Science." *Am. Statistician* 12(5):9-15.
- Houck, J. P., and M. Soliman [1971]. "Revisions of the Major U.S. Agricultural Price Indexes: An Empirical Analysis." USDA, ERS. Unpublished.
- Houk, H. J. [1957]. "Discussion: Evaluation of Available Data for Estimating Market Supplies and Prices of Hogs." *J. Farm Econ.* 39:1408-1410.
- House, P. [1961]. *State Action Relating to Taxation of Farmland on the Rural-Urban Fringe*. USDA, ERS Report 13.
- [1967]. *Differential Assessment of Farmland near Cities: Experience in Maryland through 1965*. USDA, ERS Report 358.
- Houseman, E. E. [1947]. "The Sample Design for a National Farm Survey by the BAE." *J. Farm Econ.* 29:241-245.
- [1949]. "Design of Samples for Surveys." *Agr. Econ. Res.* 1:3-10.
- [1950]. "Sampling Methods in Marketing Research." *Agr. Econ. Res.* 2:73-81.
- [1953]. "Statistical Treatment of the Nonresponse Problem." *Agr. Econ. Res.* 5:12-19.
- [1955]. "Some Recent Advances in Statistics in the USDA." *J. Am. Stat. Assoc.* 50:581 (abstract).
- [1957]. "Sample Design for the Survey of Farm Operators' 1955 Expenditures." *Estadística* 15:591-600.
- [1964]. "Sources of Data for Econometric Models." *J. Farm Econ.* 46:1400-1406.
- [1972]. "The Survey as a Measurement Instrument." *Agr. Econ. Res.* 24:87-92.
- Houseman, E. E., and J. A. Becker [1967]. "A Centenary Profile of Methods for Agricultural Surveys." *Am. Statistician* 21(2):15-21.
- Houseman, E. E., and H. F. Huddleston [1966]. "Forecasting and Estimating Crop Yields from Plant Measurements." *FAO Monthly Bulletin Agr. Econ. and Stat.* 15(10):1-6.
- Houseman, E. E., and T. J. Reed [1954]. *Application of Probability Area Sampling to Farm Surveys*. USDA Agriculture Handbook 67.
- Houseman, E. E., and H. C. Trelogan [1967]. "Progress toward Optimizing Agricultural Area Sampling." In *Bulletin of the International Statistical Institute: Proceedings*, 36th Session, vol. 42, 1:293-304.
- Houthakker, H. S. [1968]. "'Realized' Farm Income: An Outmoded Concept? Reply." *Am. J. Agr. Econ.* 50:156.
- Howe, E. C., and C. R. Handy [1975]. "Inventory and Critique of Productivity Estimates of the U.S. Food and Fiber Sector." *Am. J. Agr. Econ.* 57:916-921.
- Howe, E. C., C. R. Handy, and L. G. Traub [1975]. In *Search of an Industry Capital Stock*. USDA, ERS Working Paper.
- Huddleston, H. F. [1950]. "Methods Used in a Survey of Orchards." *Agr. Econ. Res.* 2:126-130.
- [1965]. "A New Area Sampling Frame and Its Uses." *J. Farm Econ.* 47:1524-1533.

- [1968]. "Point Sampling Surveys in Colorado's San Luis Valley." *Agr. Econ. Res.* 20:1-4.
- [1971]. "Use of Photography in Sampling for Number of Fruit per Tree." *Agr. Econ. Res.* 23:63-67.
- Hulten, C. R. [1974]. "Growth Accounting with Intermediate Inputs." Johns Hopkins University. Mimeo.
- Hurlburt, V. L. [1950]. *Buying of Farms in Story County, Iowa, 1940-48*. Iowa Agricultural Experiment Station Research Bulletin 377.
- [1959]. *On the Theory of Evaluating Farmland by the Income Approach*. USDA, ARS, unnumbered report.
- Hurley, R. [1949]. "Plans for the 1950 Census of Agriculture." *J. Farm Econ.* 31:1284-1293. P. J. Crees, "Discussion," pp. 1293-1295; J. R. Motheral, "Discussion," pp. 1295-1296. R. S. Overton, "Discussion," pp. 1296-1297.
- [1954]. "Plans for the 1954 Census of Agriculture." *J. Farm Econ.* 36:1240-1247.
- [1958]. "Plans and Publication of State and Local Data for the 1959 Census of Agriculture." *J. Farm Econ.* 40:1782-1786.
- [1962]. "Census Concepts: Past, Present and Future." *J. Farm Econ.* 44:616-621.
- [1965]. "Problems Relating to Criteria for Classification of Farms." *J. Farm Econ.* 47:1565-1571.
- Hurley, R., and R. K. Smith [1951]. "New Approaches and Methods for the Census." *Agr. Econ. Res.* 3:113-118.
- Hurley, R., T. Jabine, and D. Larson [1963]. "Evaluation Studies of the 1959 Census of Agriculture." *J. Am. Stat. Assoc.* 58:554 (abstract).
- Hurst, R. L. [1969]. *Rural Housing in the Northeast Coastal Plain Area of South Carolina*. USDA Agricultural Economic Report 163.
- Hurwitz, A. [1962]. "Constants and Compromise in the Consumer Price Index." *J. Am. Stat. Assoc.* 57:813-825.
- Ingram, J. J., and D. Prochaska [1972]. "Measuring Completeness of Coverage in the 1969 Census of Agriculture." In *Abstracts Booklet*, ASA, p. 69.
- Irwin, G. D. [1968]. "Three Myths about the Balance Sheet: The Changing Financial Structure of Farming." *Am. J. Agr. Econ.* 50:1596-1599.
- Ives, J. R. [1957]. "An Evaluation of Available Data for Estimating Market Supplies and Prices of Cattle." *J. Farm Econ.* 39:1411-1418.
- Jacobs, E. E. [1975]. "Progress Report on the 1972-73 Consumer Expenditure Survey." In *Abstracts Booklet*, ASA, p. 72.
- Jebe, E. H. [1952]. "Estimation for Sub-sampling Designs Employing the County as a Primary Sampling Unit." *J. Am. Stat. Assoc.* 47:49-70.
- Jebe, E. H., and E. S. Clifton [1956]. "Estimating Yields and Grades of Slaughter Steers and Heifers." *J. Farm Econ.* 38:584-596.
- Jennings, R. D. [1958]. *Consumption of Feed by Livestock, 1909-56: Relation between Feed, Livestock, and Food at the National Level*. USDA Production Research Report 21.
- Jessen, R. J. [1939]. "An Experiment in Design of Agricultural Surveys." *J. Farm Econ.* 21:855-863.
- [1942]. *Statistical Investigation of a Sample Survey for Obtaining Farm Facts*. Iowa Agricultural Experiment Station Research Bulletin 304.
- [1947]. "The Master Sample Project and Its Use in Agricultural Economics." *J. Farm Econ.* 29:531-540.

- [1949]. "Some Inadequacies of the Federal Censuses of Agriculture." *J. Am. Stat. Assoc.* 44:279-292.
- [1955]. "Determining the Fruit Count on a Tree by Randomized Branch Sampling." *Biometrics* 11:99-109.
- Johnson, D. G., and M. C. Nottenburg [1951]. "A Critical Analysis of Farm Employment Estimates." *J. Am. Stat. Assoc.* 46:181-205.
- Johnson, G. L. [1952]. *Burley Tobacco Control Programs: Their Over-All Effect on Production and Prices, 1933-50*. Kentucky Agricultural Experiment Station Bulletin 580.
- Johnson, P. L. ed. [1969]. *Remote Sensing in Ecology*. Athens: University of Georgia Press.
- Jones, L. A. [1966]. *Rural Home Financing through the Voluntary Home Mortgage Credit Program*. USDA, ERS Report 270.
- Jorgenson, D. W. [1964]. "Minimum Variance, Linear, Unbiased Seasonal Adjustment of Economic Time Series." *J. Am. Stat. Assoc.* 59:681-724.
- Jorgenson, D. W., and Z. Griliches [1967]. "The Explanation of Productivity Change." *Rev. Econ. Studies* 34:249-283; reprinted with corrections in 1969 in *Survey of Current Business* 49(5):29-64 (part 2); again reprinted with corrections in 1972 in *Survey of Current Business* 52(5):3-36 (part 2).
- [1972a]. "Issues in Growth Accounting: A Reply to Edward F. Denison." *Survey of Current Business* 52(5): 65-94 (part 2).
- [1972b]. "Final Reply." *Survey of Current Business* 52(5):111 (part 2).
- Juster, F. T. [1970]. "Microdata, Economic Research, and the Production of Economic Knowledge." *Am. Econ. Rev.* 60:138-148.
- Keith, K., and W. D. Purcell [1976]. "Possible Implications of Voids in USDA Cattle Slaughter Data." *Am. J. Agr. Econ.* 58:568-571.
- Kelly, B. W. [1958]. "Objective Methods for Forecasting Florida Citrus Production." *Estadistica* (journal of the Inter-American Statistical Institute) 58:56.
- [1963]. "Probability Sampling in Collecting Farm Data." *J. Farm Econ.* 45: 1515-1520.
- Kendrick, J. W. [1961]. *Productivity Trends in the United States*. National Bureau of Economic Research, Princeton: Princeton University Press.
- [1972]. *Economic Accounts and Their Uses*. New York: McGraw-Hill.
- [1973]. *Postwar Productivity Trends in the United States, 1948-1969*. National Bureau of Economic Research.
- King, A. J., and R. J. Jessen [1945]. "The Master Sample of Agriculture." *J. Am. Stat. Assoc.* 40:38-56.
- Kirkbride, J. W. [1969]. "Response Problems in Probability Sampling." *Am. J. Agr. Econ.* 51:1214-1217.
- Kish, L. [1962]. "Studies of Interviewer Bias for Attitudinal Variables." *J. Am. Stat. Assoc.* 57:92-115.
- Kizer, L. G. [1967]. "Discussion: Comprehensive Agricultural Data Systems." *J. Farm Econ.* 49:1553-1556.
- Klein, L. R. [1971]. "Whither Econometrics?" *J. Am. Stat. Assoc.* 66:415-421.
- Knutson, G. [1949]. "Winter Storm Livestock Loss Surveys." *J. Farm Econ.* 31:1276-1283.
- Knutson, G., and F. K. Harmston [1950]. "Problems in Sampling a Heterogeneous Agriculture." *Agr. Econ. Res.* 2:98-100.

- Koenig, P. [1951]. "Some Applications of U.S. Experience to Data Problems of Other Countries." *J. Farm Econ.* 33:797-804.
- Koffsky, N. M. [1947]. "Some Statistical Problems Involved in Types of Farm Income, by Size." *J. Farm Econ.* 29:1257-1266.
- [1958]. "Farm Income Estimation Methods and Meaning." *J. Am. Stat. Assoc.* 53:581 (abstract).
- [1961]. "Potential Demand for Farm Products over the Next Quarter Century." In *Dynamics of Land Use: Needed Adjustments*. Ames: Iowa State University Press.
- [1962a]. "Analytic Concepts: Changes Induced by Technological Change and Economic Developments." *J. Farm Econ.* 44:625-632.
- [1962b]. "What the Federal-State Farm Economic Intelligence Service Is and Does." *J. Farm Econ.* 44:1754-1759.
- [1966]. "Agricultural Economics in the USDA." *J. Farm Econ.* 48:413-421.
- Konyha, M. E. [1971]. *Rural Poor Who Could Benefit from Job Retraining in the East North Central States*. USDA Agricultural Economic Report 204.
- Kottke, M. W. [1964]. "Discussion: Statistical Bottlenecks to Econometric Analysis." *J. Farm Econ.* 46:1406-1410.
- Kramer, R. C., and J. D. Shaffer [1954]. "The Case for the Mail Survey." *J. Farm Econ.* 36:575-589.
- Kromer, G. W. [1970]. "Structural Changes in the Soybean Industry." In *Fats and Oils Situation*, USDA, ERS, FOS-253, pp. 16-42.
- Kroupa, E. A., and C. Burnett [1973]. *Wisconsin Farmers' Use and Understanding of Broadcast Market News*. University of Wisconsin, College of Agriculture and Life Sciences, Research Report R2506.
- Krueger, P. F. [1963]. "Discussion: The Changing World for Agricultural Statistics." *J. Farm Econ.* 45:1506-1507.
- Kuhn, T. S. [1970]. *The Structure of Scientific Revolutions*. Second edition. Chicago: University of Chicago Press.
- Kutish, F. A. [1955]. "Needed Changes in State and Local Crop and Livestock Reports." *J. Farm Econ.* 37:1050-1053.
- Kuznets, G. M., and G. Harvey [1953]. "Forecasting Fruit Production in California." *J. Am. Stat. Assoc.* 48:619 (abstract).
- Landsberg, H. H., L. L. Fischman, and J. L. Fisher [1962]. *Resources in America's Future, Patterns of Requirements and Availabilities, 1960-2000*, Baltimore: Johns Hopkins University Press.
- Landau, E., and C. S. Brandt [1966]. "The Use of Surveys to Estimate Air Pollution Damage to Agriculture." *Biometrics* 22:952 (abstract).
- Lavell, R. [1959]. "Introduction of New Regional Indexes for Food Consumption Analysis." In *National Food Situation*, USDA, ERS, NFS-89, pp. 17-40.
- LeBovit, C. [1970]. "Foods Eaten away from Home." In *National Food Situation*, USDA, ERS, NFS-132, pp. 25-31.
- LeBovit, C., E. Cofer, J. Murray, and F. Clark [1961]. *Dietary Evaluation of Food Used in Households in the United States*. USDA, ARS, Household Food Consumption Survey, 1955, Report 16.
- Lee, A. T. M., and K. L. Bachman [1953]. "The 1950 Census of Agriculture as a Source of Basic Data for Economic Research." *Agr. Econ. Res.* 5:45-52.
- Lee, G. E., and R. C. Nicholson [1973]. "Managerial Information (Recording, Data, and Decision) Systems in Canada." *Am. J. Agr. Econ.* 55:921-929.

- Lee, I. M. [1952]. "A Critical Evaluation of Available Agricultural Statistics." *J. Am. Stat. Assoc.* 47:267-280.
- Leiman, M. [1967]. *Food Retailing by Discount Houses*. USDA Marketing Research Report 785.
- Leonard, L. A. [1960]. *Assessment of Farm Real Estate in the United States*. USDA, ARS Report 43-117.
- Leontief, W. W. [1971]. "Theoretical Assumptions and Non-observed Facts." *Am. Econ. Rev.* 61:1-7.
- Leuthold, R. M., A. J. A. MacCormick, A. Schmitz, and D. G. Watts [1970]. "Forecasting Daily Hog Prices: A Study of Alternative Forecasting Techniques." *J. Am. Stat. Assoc.* 65:90-107.
- Leven, C. L. [1965]. "Theories of Regional Growth." In *Problems of Chronically Depressed Areas*, Agricultural Policy Institute, North Carolina State University and the Tennessee Valley Authority, API Series 19.
- Light, R. J., F. Mosteller, and H. Winokur, Jr. [1971]. "Using Controlled Field Studies to Improve Public Policy." *Report of the President's Commission on Federal Statistics*, vol. 2, Washington.
- Loftsgard, L. D., J. E. Johnson, and T. K. Ostenson [1963]. *Taxes Levied on Personal Property in North Dakota*. North Dakota State University, Department of Agricultural Economics. Mimeo.
- Loomis, R. A. [1957]. "Effect of Weight-Period Selection on Measurement of Agricultural Production Inputs." *Agr. Econ. Res.* 9:129-136.
- Loomis, R. A., and G. T. Barton [1961]. *Productivity of Agriculture, United States, 1870-1958*. USDA Technical Bulletin 1238.
- Lowenstein, F. [1954]. "Variations in Crop Forecasts for Cotton." *J. Farm Econ.* 36:674-680.
- Luby, P. J. [1957]. "Evaluation of Available Data for Estimating Market Supplies and Prices of Hogs." *J. Farm Econ.* 39:1402-1408.
- Lund, L. A., and M. C. Burk [1969]. *A Multidisciplinary Analysis of Children's Food Consumption Behavior*. Minnesota Agricultural Experiment Station Technical Bulletin 265.
- Lunde, A. S. [1975]. "Problems in the Establishment of National Data Systems." In *Abstracts Booklet*, ASA, p. 99.
- Lutz, E. A. [1960]. *Local and State Financing in the United States and New York State*. New York State College of Agriculture Extension Bulletin 1040.
- McAllister, K. J. [1950]. "The Role of Market News in Marketing and Some Problems." *J. Farm Econ.* 32:958-968.
- McCormick, F. B. [1955]. "Livestock and Grain Market Report—They Can Be Improved." *J. Farm Econ.* 37:461-470.
- McElveen, J. V. [1969]. *Characteristics of Human Resources in the Rural Southeast Coastal Plain . . . with Emphasis on the Rural Poor*. USDA Agricultural Economic Report No. 155.
- McElveen, J. V., and K. L. Bachman [1953]. *Low Production Farms*. USDA Agriculture Information Bulletin 108.
- McElveen, J. V., and B. L. Dillman [1971]. *A Profile of the Rural Poor in the Coastal Plain of Northeastern South Carolina*. USDA Agricultural Economic Report 202.
- McGregor, R. A., and O. M. Frost [1959]. "Comparative Methods of Surveying Horticulture Specialty Crops." *Agr. Econ. Res.* 11:106-114.

- McHugh, R. B. [1961]. "Confidence Interval Inference and Sample Size Determination." *Am. Statistician* 15(2):14-17.
- McPherson, W. K. [1956]. "Improvement of Livestock and Grain Market Reports." *J. Farm Econ.* 38:154-158.
- McVay, F. E. [1947]. "Sampling Methods Applied to Estimating Numbers of Commercial Orchards in a Commercial Peach Area." *J. Am. Stat. Assoc.* 42:533-540.
- McVay, F. E., and H. Tucker [1950]. *A Study of Agricultural Price Statistics in North Carolina*. Institute of Statistics Mimeo Series 42.
- Madden, J. P. [1970]. "Social Change and Public Policy in Rural America: Data and Research Needs for the 1970's." *Am. J. Agr. Econ.* 52:308-314.
- [1973]. "On the Measurement of Program Effects." Paper prepared for AAEA Task Force on Social and Economic Statistics.
- Madden, J. P., J. L. Pennock, and C. M. Jaeger [1968]. "Equivalent Levels of Living: A New Approach to Scaling the Poverty Line to Different Family Characteristics and Place of Residence." In *Rural Poverty in the United States*, a report by the President's National Advisory Commission on Rural Poverty, Washington, D.C., pp. 545-552.
- Maisel, S. J. [1974]. "The Economics and Finance Literature and Decision Making." *J. Finance* 29:313-322.
- Marion, B. W., and C. R. Handy [1973]. *Market Performance Concepts and Measures*. USDA Agricultural Economic Report 244.
- Marks, E. S., W. P. Mauldin, and H. Nisselson [1953]. "The Post-enumeration Survey of the 1950 Census: A Case History in Survey Design." *J. Am. Stat. Assoc.* 48:220-243.
- Marschak, J. [1971]. "Economics of Information Systems." *J. Am. Stat. Assoc.* 66:192-219.
- Marsh, M., and H. E. Conklin [1953]. "Farm Variability within Block Samples." *J. Farm Econ.* 35:283-285.
- Marshall, J. T. [1962]. "A Comparison of Some of the Census Concepts Used in Canada and the U.S." *J. Am. Stat. Assoc.* 57:494 (abstract).
- Martin, L. R. [1970]. "Characteristics of Poverty in the United States, 1970." Public lecture, University of California, Berkeley.
- Masucci, R. H. [1959]. *Dollar Volume of Agriculture's Transactions with Industry*. USDA Marketing Research Report 375.
- [1962]. "Income Parity Standards for Agriculture." *Agr. Econ. Res.* 14:121-133.
- Mathis, A. G. [1968]. "Changing Patterns of Fluid Milk Sales." In *Dairy Situation*, USDA, ERS, DS-322, pp. 24-27.
- [1970]. "More Whey Is Coming." In *Dairy Situation*, USDA, ERS, DS-332, pp. 26-32.
- Matthews, T. H., and R. Bird [1970]. *Personal Property Taxes Levied on Farmers, 1950 to 1967*. USDA Statistical Bulletin 447.
- Mayer, L. V., and J. D. Ahalt [1974]. "Public Policy Demands and Statistical Measures of Agriculture." *Am. J. Agr. Econ.* 56:984-987.
- Mead, E. [1926]. *Federal Reclamation: What It Should Include*. Government Printing Office.
- [1931]. *The Place of Federal Reclamation in Federal Land Policy*. Government Printing Office.
- Melichar, E., and R. J. Doll [1969]. "Capital and Credit Requirements of Agriculture

- and Proposals to Increase Availability of Bank Credit." In *Reappraisal of the Federal Discount Mechanism* 1:107-112, U.S. Federal Reserve System, Board of Governors.
- Mendelowitz, A. I. [1971]. "The Measurement of Economic Depreciation." *J. Am. Stat. Assoc.* 66:140-148.
- Mighell, R. L. [1969]. "What are Farms and Who Are Farmers?" Unpublished paper.
- Mikesell, J. J. [1971]. *Selected Characteristics of Open Country Mobile Home Residents, East North Central States, 1967*. USDA Agricultural Economic Report 203.
- Miklius, W. [1969]. *Economic Performance of Motor Carriers Operating under the Agricultural Exemption in Interstate Trucking*. USDA Marketing Research Report 838.
- Miller, R. H. [1968]. "Estimating Domestic Tobacco Use through Regression Methods." Paper presented at 22nd Tobacco Workers Conference, Asheville, N.C., July 22.
- Miller, R. R. [1971]. "The Changing U.S. Cheese Industry." In *Dairy Situation*, USDA, ERS, DS-336, pp. 18-33.
- Moore, C. V. [1961]. "A General Analytical Framework for Estimating the Production Function for Crops Using Irrigation Water." *J. Farm Econ.* 43:876-888.
- Morgan, A. F., ed. [1959]. *Nutritional Status, U.S.A.* California Agricultural Experiment Station Bulletin 769.
- Morgan, J. N., and J. A. Sonquist [1963]. "Problems in the Analysis of Survey Data and a Proposal." *J. Am. Stat. Assoc.* 58:415-434.
- Morgenstern, O. [1973]. *On the Accuracy of Economic Observations*. Second edition. Princeton: Princeton University Press.
- Morton, J. E. [1969]. *On the Evolution of Manpower Statistics*. Kalamazoo: Upjohn Institute.
- [1972]. "A Student's Guide to American Federal Government Statistics." *J. Econ. Lit.* 10:371-397.
- Murray, N. C. [1939]. "A Close-Up View of the Development of Agricultural Statistics from 1900-1920." *J. Farm Econ.* 21:707-717.
- Murray, R. A., and R. D. Reinsel [1965]. *The Transfer of Farm and Open Country Real Estate in Six Maryland Counties, 1962*. Maryland Agricultural Experiment Station Miscellaneous Publication 557.
- Naive, J. J., C. B. Cox, and J. R. Wiley [1957]. *Accuracy of Estimating Live Grades and Dressing Percentages of Slaughter Hogs*. Indiana Agricultural Experiment Station Bulletin 650.
- National Academy of Sciences [1970]. *Remote Sensing: With Special Reference to Agriculture and Forestry*. Committee on Remote Sensing for Agricultural Purposes, National Research Council.
- National Advisory Commission on Food and Fiber [1967]. *Food and Fiber for the Future*. Washington, D.C. Pp. 284-292.
- National Commission on Food Marketing [1966a]. *Food from Farmer to Consumer: Final Report*. U.S. Government Printing Office.
- [1966b]. *Organization and Competition in the Poultry and Egg Industries*. Technical Study 2.
- [1966c]. *Organization and Competition in the Dairy Industry*. Technical Study 3.
- [1966d]. *Organization and Competition in the Fruit and Vegetable Industry*. Technical Study 4.

- [1966e]. *Organization and Competition in the Milling and Baking Industries*. Technical Study 5.
- [1966f]. *The Structure of Food Manufacturing*. Technical Study 8.
- [1966g]. *Cost Components of Farm-Retail Price Spreads for Foods*. Technical Study 9.
- Nelson, P. E., Jr. [1965]. *Market News Dissemination in the Southwest: How the Feed-Grain and Livestock Industries Obtain and Evaluate Market Information*. USDA Agricultural Economic Report 71.
- Nelson, T. R. [1967]. "Discussion: Comprehensive Agricultural Data Systems." *J. Farm Econ.* 49:1556-1558.
- Neter, J., and J. Waksberg [1964]. "A Study of Response Errors in Expenditures Data from Household Surveys." *J. Am. Stat. Assoc.* 59:18-55.
- Newell, S. R. [1953]. "Planning within Agricultural Estimates for a Workable Modernization Program." *J. Farm Econ.* 35:855-864.
- [1957]. "A Program for Development of Crop and Livestock Estimates." Paper presented at the annual meeting of the ASA, Atlantic City, N.J.
- [1958a]. "A Program for Development of Crop and Livestock Estimates." *J. Am. Stat. Assoc.* 53:587 (abstract).
- [1958b]. "Discussion: Present and Future Program for Agricultural Statistics in Canada." *J. Farm Econ.* 40:1769-1771.
- Neyman, J. [1934]. "On the Two Different Aspects of the Representative Method: The Method of Stratified Sampling and the Method of Purposive Selection." *J. Royal Stat. Soc. (Series A)* 97:558-606.
- Nieto-Ostolaza, Maria Del Carmen [1973]. "Balance Between Statistical Information and Models in Agricultural Research." *International Journal of Agrarian Affairs* 5: 458-470.
- Nikolitch, R., and D. E. McKee [1965]. "The Contribution of the Economic Classification of Farms to the Understanding of American Agriculture." *J. Farm Econ.* 47: 1545-1554.
- Niskanen, W. A., Jr. [1971]. *Bureaucracy and Representative Government*. Chicago: Aldine and Atherton.
- Nordquist, A. V. [1952]. "Measuring Magnitudes and Trends in the Production of Livestock and Meat." *J. Am. Stat. Assoc.* 47:77-90.
- [1956]. "Livestock Estimates and the Search for Further Improvement." *Agr. Econ. Res.* 8:128-131.
- Nybrotten, N. [1953]. "Consumer Choice and Research in Standards for Consumer Grades." *J. Farm Econ.* 35:135-139.
- Ogren, K. E. [1956]. "The Farmer's Share: Three Measurements." *Agr. Econ. Res.* 8:43-50.
- Ogren, K., F. E. Scott, K. Parr, and H. Rabinowitz [1957]. *Farm-Retail Spreads for Food Products: Costs, Prices*. USDA Miscellaneous Publication 741 (supersedes 576).
- Olson, M., Jr. [1970]. "The National Income and the Level of Welfare: Recent Progress in Social Accounts." *Proceedings Am. Stat. Assoc., Business and Economics Section*, pp. 198-207.
- Orcutt, G. H. [1970]. "Basic Data for Policy and Public Decisions: Technical Aspects—Data, Research and Government." *Am. Econ. Rev., Papers and Proceedings* 60(2): 132-137.
- Oury, B. [1965]. "Allowing for Weather in Crop Production Model Building." *J. Farm Econ.* 47:270-283.

- Overton, R. S. [1949]. "Sampling to Develop New Statistical Series." *Agr. Econ. Res.* 1:87-92.
- Paarlberg, D. [1950]. "Discussion: Agricultural Statistics." *J. Farm Econ.* 32:879-880.
- Pallesen, J. E. [1962]. "Discussion: Census Concepts—Past, Present and Future." *J. Farm Econ.* 44:622-624.
- Palmer, C. O., and E. O. Schlotzhauer [1950]. "Methods of Forecasting Fruit Production." *Agr. Econ. Res.* 2:10-19.
- Palmer, W. C. [1962]. *Meteorological Drought*. U.S. Weather Bureau Technical Paper 45.
- Parker, C. V. [1951]. "Organization of Agricultural Statistics Work in Canada." *J. Farm Econ.* 33:787-794.
- Parker, C. V., and A. D. Holmes [1958]. "Present and Future Program for Agricultural Statistics in Canada." *J. Farm Econ.* 40:1758-1769.
- Parr, R. D., and L. D. Calvin [1956]. "Research on Objective Forecasts of Filbert Production." *Agr. Econ. Res.* 8:92-94.
- Parsons, M. S., F. H. Robinson, P. Strickler [1960]. *Farm Machinery: Use, Depreciation, and Replacement*. USDA Statistical Bulletin 269.
- Pavelis, G. A. [1965]. "Coordinating Physical and Economic Data in Water Resource Planning." Paper presented to staff conference, USDA, ARS Soil and Water Conservation Research Division, Memphis, Tenn.
- Pearson, F. A., and G. E. Brandow [1939]. "Agricultural Price Statistics in the United States and Abroad." *J. Farm Econ.* 21:788-797.
- Pechman, J. A., and P. M. Timpane, eds. [1975]. *Work Incentives and Income Guarantees: The New Jersey Negative Income Tax Experiment*. Brookings Institution.
- Penson, J. B., Jr. [1972]. "Demand for Financial Assets in the Farm Sector: A Portfolio Balance Approach." *Am. J. Agr. Econ.* 54:163-174.
- Penson, J. B., Jr., and C. B. Baker [1978]. *An Aggregative Income and Wealth Simulator for the Farm Sector: Its Description and Analysis*. USDA Technical Bulletin. In process.
- Penson, J. B., Jr., D. A. Lins, and G. D. Irwin [1971]. "Flow-of-Funds Social Accounts for the Farm Sector." *Am. J. Agr. Econ.* 53:1-7.
- Perkinson, L. B. [1969]. "General Hospital Facilities in Michigan, 1965." *Am. J. Agr. Econ.* 51:1548-1552.
- Perrin, R. K. [1968]. *Analysis and Prediction of Crop Yields for Agricultural Policy Purposes*. Unpublished Ph.D. dissertation, Iowa State University.
- Peterson, A. G. [1947]. "Agricultural Price Index Numbers." *J. Am. Stat. Assoc.* 42:597-604.
- [1950]. "Letter to the Editor—The Parity Price Index of the Department of Agriculture." *Am. Statistician* 4(1):1.
- Peterson, G. A., and E. O. Heady [1955]. *Application of Input-Output Analysis to a Simple Model Emphasizing Agriculture*. Iowa Agricultural Experiment Station Research Bulletin 427.
- Phelps Brown, E. H. [1972]. "The Underdevelopment of Economics." *Econ. J.* 82:1-10.
- Pine, W. H. [1956]. *Farm and City Real Estate Taxes in Kansas*. Kansas Agricultural Experiment Station Bulletin 382.
- Pine, W. H., and W. H. Scofield [1961]. *The Farm Real Estate Market in Kansas*. Kansas Agricultural Experiment Station Bulletin 428.
- Plaunt, D. H. [1967]. "Canada's Experience in and Aspirations for a Comprehensive Farm Data System." *J. Farm Econ.* 49:1526-1540.

- Price, D. W. [1967]. *Specifying the Effects of Household Composition on United States Food Expenditures*. Michigan State University Research Bulletin 16.
- Proctor, C. H. [1965]. "Variations in Response Errors Induced by Changing Instructions to Enumerators." *Proceedings, Am. Stat. Assoc. Social Stat. Section*, pp. 51-55.
- Proctor, C. H., and B. Stines [1963]. *An Experimental Survey to Study Response Errors in Agricultural Enumerative Surveys*. North Carolina State University, Institute of Statistics, Progress Report 34.
- [1972]. "Conversational Activity and the Quality of Information from Interviews for Obtaining Farm Facts." *Agr. Econ. Res.* 24:16-20.
- Purcell, J. C., and R. Raunika [1971]. "Price Elasticities from Panel Data: Meat, Poultry, and Fish." *Am. J. Agr. Econ.* 53:216-221.
- Puterbaugh, H. L. [1961]. "Purchasing Power of Urban, Rural Nonfarm and Rural Farm Income, 1955." *Agr. Econ. Res.* 13:89-94.
- Quackenbush, G. G. [1954]. "Demand Analysis from the M.S.C. Consumer Panel." *J. Farm Econ.* 36:415-427.
- Quackenbush, G. G., and J. D. Shaffer [1960]. *Collecting Food Purchase Data by Consumer Panel*. Michigan Agricultural Experiment Station Technical Bulletin 279.
- Ramsey, C. E. [1959]. "Discussion: Structural Changes in Agriculture and Research Data Needs." *J. Farm Econ.* 41:1491-1494.
- Randall, C. K. [1949]. "Parity Prices." *Agr. Econ. Res.* 1:11-16.
- [1968]. "'Realized' Farm Income: An Outmoded Concept? Comment." *Am. J. Agr. Econ.* 50:430-432.
- Randall, C. K., and R. H. Masucci [1963]. "Farm and Nonfarm Income." *J. Farm Econ.* 45:359-366.
- Randall, C. K., and A. S. Rojko [1961]. "Methods, Assumptions and Results of the Price and Income Projections of the U.S. Department of Agriculture." *J. Farm Econ.* 43:348-356.
- Rathbun, D. B. [1972]. "The Report of the President's Commission on Federal Statistics." *Am. Statistician* 26(1):15-18.
- Raunika, R., J. C. Purcell, and J. C. Elrod [1969]. *Spatial and Temporal Aspects of the Demand for Food in the United States—Fluid Milk*. Georgia Agricultural Experiment Station Research Bulletin 61.
- Raup, P. M. [1959]. "Structural Changes in Agriculture and Research Data Needs." *J. Farm Econ.* 41:1480-1491.
- Ray, R. M., III, and H. F. Huddleston [1976]. "Illinois Crop Acreage Estimation Experiment." In *Symposium Proceedings on Machine Processing of Remotely Sensed Data*, Purdue University.
- Reagan, B. B. [1954]. "Condensed vs. Detailed Schedule in Expenditure Survey." *Agr. Econ. Res.* 6:41-53.
- Reed, F. K. [1949]. "The Mailed Inquiry and Methods of Increasing Returns." *J. Farm Econ.* 31:1265-1273. R. K. Smith, "Discussion," pp. 1273-1275.
- Reinsel, R. D. [1973]. *The Aggregate Real Estate Market*. Unpublished Ph.D. dissertation, Department of Agricultural Economics, Michigan State University.
- Reinsel, R. D., and R. D. Drenz [1972]. *Capitalization of Farm Program Benefits into Land Values*. USDA, ERS Report 506.
- Renshaw, E. F. [1957]. "Are Land Prices Too High? A Note on Behavior in the Land Market." *J. Farm Econ.* 39:505-510.

- Rice, S. A., A. F. Hinrichs, H. R. Tolley, and P. M. Hauser [1945]. "Problems of Integrating Federal Statistics: A Round Table." *J. Am. Stat. Assoc.* 40:237-244.
- Riley, H. E. [1956]. "Discussion: A Critique of Federal Statistical Series: Index of Consumer Prices." *J. Farm Econ.* 38:394-395.
- Ritz, P. M. [1955]. "Agriculture, a Commodity Producing Segment in the 1947 Inter-industry Relations Study." In *Input-Output Analyses, Technical Supplement to Input-Output Analysis: An Appraisal*, vol. 18, Studies in Income and Wealth. Princeton: Princeton University Press (for National Bureau of Economic Research).
- Rivlin, A. M. [1975]. "Income Distribution—Can Economists Help?" *Am. Econ. Rev.* 65:1-15.
- Robbins, P. R. [1963]. "Developing and Using Input-Output Information." *J. Farm Econ.* 45:831-838.
- Roberts, M. J. [1974]. "On the Nature and Condition of Social Science." *Daedalus* 103: 54.
- Robinson, T. C. M., and P. P. Wallraabenstein [1949]. "Estimates of Agricultural Employment." *J. Farm Econ.* 31:233-252.
- Rogers, C. E. [1965]. "A Random Sample Using Limited Mail Questionnaires and Non-response Interviews." *Agr. Econ. Res.* 18:10-12.
- Rosenblatt, D., E. Glaser, and M. K. Wood [1970]. "Principles of Design and Appraisal of Statistical Information Systems." *Am. Statistician* 24:10-15.
- Ruggles, N., and R. Ruggles [1971]. "Evolution of the National Accounts and the National Data Base." *Survey of Current Business* 51(7), part 2.
- Ruttan, V. W. [1954]. "The Relationship between the BAE Level-of-Living Indexes and the Average Incomes of Farm Operators." *J. Farm Econ.* 36:44-51.
- [1963]. "Discussion: Farm-Nonfarm Income Comparisons." *J. Farm Econ.* 45: 381-384.
- Rymes, T. K. [1972]. "The Measurement of Capital and Total Factor Productivity." *Review of Income and Wealth* 18:79-108.
- Sanderson, F. H. [1954]. *Methods of Crop Forecasting*. Cambridge: Harvard University Press.
- Sargent, R. L., J. R. Davidson, and L. A. Jones [1964]. *Availability of Rural Housing Credit in Montana*. Montana Agricultural Experiment Station Bulletin 586.
- Sarle, C. F. [1939]. "Future Improvements in Agricultural Statistics." *J. Farm Econ.* 21:838-845.
- Sarle, C. F., J. J. Heimberger, J. R. Wallace, L. Soth, J. D. Baker, Jr., and M. H. Hansen [1953]. "Discussion of Congressional House Committee Report of the Investigation of the Federal Crop Reporting Service." *Agr. Econ. Res.* 5:25-39.
- Sarle, C. F., and T. C. M. Robinson [1949]. "Measurement of Agricultural Production." *J. Farm Econ.* 31:213-230; C. Hildreth, "Discussion," pp. 231-232.
- Schaars, M. A. [1955]. "Discussion: Local Data Wanted by Business Firms." *J. Farm Econ.* 37:1057-1058.
- Schaller, W. N. [1964]. "Data Requirements for New Research Models." *J. Farm Econ.* 46:1391-1399.
- Schluter, G. E. [1972]. "Linkages between Agriculture and the U.S. National Income and Product Accounts." *J. Northeastern Agr. Econ. Council* 1:83-93.
- Schnittker, J. A. [1959]. "Discussion: Revisions of the Parity Index." *J. Farm Econ.* 41:1300-1302.

- [1963]. "The Role of Statistics in Formulating the (Proposed) Food and Agriculture Act of 1962." *J. Am. Stat. Assoc.* 58:560 (abstract).
- Schnittker, J. A., and E. O. Heady [1957]. *Application of Input-Output Analysis to a Regional Model Stressing Agriculture*. Iowa Agricultural Experiment Station Bulletin 454.
- Scholl, J. C., and C. E. Burkhead [1949]. "Interviewing Non-respondents to a Mail Survey." *Agr. Econ. Res.* 1:16-23.
- Schrader, F. M. [1951]. "Discussion: Agricultural Statistics." *J. Farm Econ.* 33:794-796.
- Schultze, C. L. [undated]. "Governmental and Public Data Needs." Unpublished paper, Brookings Institution.
- Scott, F. E., and H. Badger [1970]. "Farm Food Market Basket Statistics." In *Major Statistical Series of the U.S. Department of Agriculture, Vol. 4, Agricultural Marketing Costs and Charges*, USDA Agriculture Handbook 365.
- Scott, F. S., Jr. [1955]. "Estimating Cattle on Feed." *J. Farm Econ.* 37:127-129.
- Scott, J. T., Jr., and E. O. Heady [1969]. "Econometricians and the Data Gap: Reply." *Am. J. Agr. Econ.* 51:188.
- Scoville, O. J. [1959]. "Discussion: Needed Developments in Statistical Programs to Obtain Research Data." *J. Farm Econ.* 41:1519-1521.
- Searls, D. T. [1963]. *On the Large Observation Problem*. Unpublished Ph.D. dissertation, North Carolina State College.
- Sells, T. [1975]. "Price Spreads for Beef." Contributed paper presented at the annual meeting of the AAEA, Columbus, Ohio.
- Selltiz, C., M. Jabada, M. Deutsch, and S. W. Cook [1964]. *Research Methods in Social Relations*. New York: Holt, Rinehart, and Winston.
- Senf, C. [1949]. "The General Enumerative Surveys—II." *Agr. Econ. Res.* 1:105-128.
- Shaffer, J. D. [1959a]. "Information about Price and Income Elasticity for Food Obtained from Survey Data." *J. Farm Econ.* 41:113-118.
- [1959b]. "Differences in Costs and Returns of Stamped and Business Reply Envelopes in a Mail Survey." *J. Farm Econ.* 41:268-271.
- [1959c]. "Estimating Population Characteristics by Mail Survey." *J. Farm Econ.* 41:833-836.
- [1968]. *A Working Paper Concerning Publicly Supported Economic Research in Agricultural Marketing*. USDA, ERS.
- Shannon, C. E., and Warren Weaver [1969]. *The Mathematical Theory of Communication*. Urbana: University of Illinois Press.
- Shapiro, H. [1962]. *Taxation of Tangible Personal Property Used in Agriculture*. USDA, ERS Report 86.
- [1963]. "Economies of Scale and Local Government Finance." *Land Economics* 39:175-185.
- Shapiro, H. T. [1973]. "Is Verification Possible? The Evaluation of Large Econometric Models." *Am. J. Agr. Econ.* 55:250-258.
- Shaudys, E. T. [1969]. "Farm Panels as a Source of Farm Management Data: The Ohio Plan." *Am. J. Agr. Econ.* 51:1211-1213.
- Shaw, L. H. [1967]. "Alternative Measures of Aggregate Inputs and Productivity in Agriculture." *J. Farm Econ.* 49:670-683.
- Shaw, L. H., and D. D. Durost [1962]. *Measuring the Effects of Weather on Agricultural Output*. USDA, ERS Report 72.

- [1965]. *The Effect of Weather and Technology on Corn Yields in the Corn Belt, 1929-1962*. USDA Agricultural Economic Report 80.
- Sheehy, S. J., and R. H. McAlexander [1965]. "Selection of Representative Benchmark Farms for Supply Estimation." *J. Farm Econ.* 47:681-695.
- Sheldon, H. D. [1960]. "Where We Stand in Urban-Rural and Farm Residence Concepts." *J. Am. Stat. Assoc.* 55:371 (abstract).
- Sherr, H. [1960]. "A Basis for the Reconsideration of Wastes and Losses in Food Marketing." *Agr. Econ. Res.* 12:52-57.
- Sherr, H., E. A. Power, and R. A. Kahn [1948]. "Supply and Distribution of Fishery Products in the Continental United States, 1930-47." In *National Food Situation*, USDA, ERS, NFS-45, pp. 19-43.
- Shiskin, J. [1960]. "How Accurate?" *Am. Statistician* 14(4):15-17.
- Shoemaker, K. [1962]. "Unsolved Problems in Dissemination and Application." *J. Farm Econ.* 44:1773-1778.
- Siegel, I. H. [1956]. "What Concepts Are Appropriate to Consumer Price Indexes?" *J. Farm Econ.* 38:361-368.
- Simerl, L. H. [1962]. "Discussion: Unsolved Problems in Dissemination and Application." *J. Farm Econ.* 44:1778-1780.
- Simmons, W. [1949]. *Assessment Procedures in Rural New York*. Cornell University, New York State College of Agriculture, Extension Bulletin 760.
- Simon, M. S. [1958]. "Clothing Expenditure Units: A New Time Series." *Agr. Econ. Res.* 10:37-48.
- Simpson, G. D. [1966]. "Resources and Facilities for Providing Needed Statistics: The Role of the Statistical Reporting Service." *J. Farm Econ.* 48:1674-1682.
- [1967]. "The User and the Producer of Agricultural Statistics." Paper presented at the CENTO symposium on Agricultural Statistics, Ankara, Turkey.
- Simunek, R. W. [1974]. "National Farm Economic Accounts: Current Analytic Needs, Bookkeeping Requirements, and Future Possibilities." Unpublished paper, USDA, ERS.
- [1976]. "National Farm Capital Accounts." *Am. J. Agr. Econ.* 58:532-542.
- Sinclair, S. [1951]. "Discussion: Agricultural Statistics." *J. Farm Econ.* 33:804-806.
- Small, R. P. [1975]. "Modifications of USDA Farm Labor and Wage Rate Estimates Program." *Statistical Reporter* (U.S. OMB) 75-11:184-185.
- Smith, C. C. [1952]. "Effects of Personal Visits on Response Rates to Mail Surveys." *Agr. Econ. Res.* 4:126-127.
- Smith, R. K. [1954]. "Discussion: Agricultural Data." *J. Farm Econ.* 36:1247-1251.
- [1955]. "Discussion: Making Existing Local Data More Available and Useful." *J. Farm Econ.* 37:1053-1056.
- Snedecor, G. W. [1939]. "Design of Sampling Experiments in the Social Sciences." *J. Farm Econ.* 21:846-855.
- Southern, J. H., and W. E. Hendrix [1959]. *Incomes of Rural Families in Northeast Texas*. Texas Agricultural Experiment Station Bulletin 940.
- Southern Land Economics Research Committee [1970]. *Farmland Tenure and Farmland Use in the Tennessee Valley*. Report 9.
- Spielmann, H., and E. E. Weeks [1975]. "Inventory and Critique of Estimates of U.S. Agricultural Capacity." *Am. J. Agr. Econ.* 57:922-928.
- Spurlock, H. H. [1968]. *Rural Housing Conditions in the Arkansas, Missouri and Oklahoma Ozarks*. Arkansas Agricultural Experiment Station Bulletin 736.
- [1970]. *Rural Housing Quality in the Ozark Region as Related to Characteristics*

- of *Housing Units and Occupants*, 1966. Arkansas Agricultural Experiment Station Bulletin 758.
- [1971]. *Rural Homeowners' Use of Home Mortgage Credit in the Ozark Region*, 1966. USDA Agricultural Economic Report 211.
- Stallings, J. L. [1961]. "A Measure of the Influence of Weather on Crop Production." *J. Farm Econ.* 43:1153-1160.
- Stapp, P. [1958]. "Discussion: Agricultural Statistics in a Changing World." *J. Farm Econ.* 40:1225-1227.
- Star, S. [1974]. "Accounting for the Growth of Output." *Am. Econ. Rev.* 64:123-125.
- Stauber, B. R. [1950]. "Current Frontier in Farm Price Data." *J. Farm Econ.* 32:865-877.
- [1956]. "The Parity Index and the Farm Expenditure Survey." *J. Farm Econ.* 38:369-377.
- [1959a]. "The 1959 U.S.D.A. Index Revisions and Some Related Policy Questions." *J. Farm Econ.* 41:1272-1288.
- [1959b]. "Critical Problems of Price Index Construction." *Am. Stat. Assoc. Proceedings Business and Economic Statistics Section*, pp. 184-190.
- [1964]. "A Report on Research in the Data Collection Program of Prices Received and Prices Paid by Farmers." *J. Farm Econ.* 46:1336-1340.
- Stauber, B. R., R. F. Hale, and B. S. Peterson [1959]. "The January 1959 Revision of the Price Indexes." *Agr. Econ. Res.* 11:33-80.
- Stauber, B. R., N. M. Koffsky, and C. K. Randall [1950]. "The Revised Price Indexes." *Agr. Econ. Res.* 2:33-62.
- Steele, H. A., and G. A. Pavelis [1967]. "Economics of Irrigation Policy and Planning." In *Irrigation of Agricultural Lands*, American Society of Agronomy, Series 11.
- Steward, D. D., and P. R. Myers [1972]. *Housing 1970: Differences between SMSA's by Region with State Data*. USDA Agricultural Economic Report 230.
- Stiebeling, H. K., and C. M. Coons [1939]. "Present-Day Diets in the United States." In *Food and Life, Yearbook of Agriculture, 1939*, pp. 296-320.
- Stigler, G. J. [1961]. "The Economics of Information." *J. Pol. Econ.* 62:213-225.
- Stillman, C. W. [1949]. "Rural Health and the Truman Plan." *J. Farm Econ.* 31:391-408.
- Stine, O. C. [1946]. "Parity Prices." *J. Farm Econ.* 28:301-305.
- Stinson, T. F. [1967]. *Financing Industrial Development through State and Local Governments*. USDA Agricultural Economic Report 128.
- [1975]. "Comments on: Strategies for Long-Run Investment in Information Systems for Rural, Social, and Economic Statistics." Paper presented at the AAEA annual meeting, Columbus, Ohio.
- Stinson, T. F., E. L. Courtney, and R. Bird [1969]. *Revised Estimates of Taxes Levied on Farm Real Estate, 1950-67*. USDA Statistical Bulletin 441.
- Stocker, F. D. [1953]. *Local Sales Taxes in New York State*. Cornell University, Department of Agricultural Economics, AE 852.
- [1955]. *The Impact of Federal Income Taxes on Farm People*. USDA, ARS 43-11.
- [1956]. "Disposable Income of Farm People." *Agr. Econ. Res.* 8:13-17.
- [1957]. "Some Effects of Suburban Residential Development on Local Finances." *Agr. Econ. Res.* 9:37-53.
- [1963]. *Selected Legislative and Other Documents on the Preferential Assessment of Farmland*. USDA, ERS, AER 256.

- Stocker, F. D., and J. C. Ellickson [1959]. "How Fully Do Farmers Report Their Incomes?" *National Tax J.*, 12:116-126.
- Stoner, J. E. [1967]. *Interlocal Government Cooperation*. USDA Agricultural Economic Report 118.
- Stout, R. G. [1962]. "Estimating Citrus Production by Use of the Frame Count Survey." *J. Farm Econ.* 44:1037-1049.
- Sturt, D. W. [1972]. "The Need for Rural Labor Market Information at the National Level." *Labor Market Information in Rural Areas*. Michigan State University, Center for Rural Manpower and Public Affairs.
- Sudman, S., and R. Ferber [1971]. "Experiments in Obtaining Consumer Expenditures by Diary Methods." *J. Am. Stat. Assoc.* 66:725-735.
- Sundquist, W. B. [1970]. "Changing Structure of Agriculture and Resulting Statistical Needs." *Am. J. Agr. Econ.* 52:315-320.
- Szaniawski, K. [1967]. "The Value of Perfect Information." *Synthese* 17:408-424.
- Taeuber, C. [1947]. "Some Aspects of the Statistics Program in the Department of Agriculture." *J. Am. Stat. Assoc.* 42:41-45.
- [1957]. "Some Results of the 1954 Census of Agriculture." *J. Am. Stat. Assoc.* 52:382 (abstract).
- [1971]. "Future Structure of Census Data Relating to Agriculture and Rural People." *Am. J. Agr. Econ.* 53:909 (abstract).
- Taylor, C. C., G. H. Aull, C. E. Woodall, and W. H. Faver, Jr. [1960]. *Suggested Procedures for the Assessment of Farm Real Estate in South Carolina*. South Carolina Agricultural Experiment Station AE 188.
- Taylor, H. C. [1939]. "A Century of Agricultural Statistics." *J. Farm Econ.* 21:697-706.
- Taylor, H. M. [1950]. "Discussion: Farm Price Data." *J. Farm Econ.* 32:877-879.
- Teele, R. P. [1927]. *The Economics of Land Reclamation in the United States*. Chicago: Shaw.
- Teper, L. [1956]. "BLS Consumers' Price Index and the AMS Index of Prices Paid by Farmers for Family Living—A Juxtaposition." *J. Farm Econ.* 38:378-390.
- Theil, H. [1958]. *Economic Forecasts and Policy*. Amsterdam: North-Holland.
- Thomas, M. D. [1956]. "Data Requirements in Agricultural Administration and Research." *J. Farm Econ.* 38:1452-1454.
- Thompson, L. M. [1962]. "Evaluation of Weather Factors in the Production of Wheat." *J. Soil and Water Conservation* 17:149-156.
- [1963a]. "Evaluation of Weather Factors in the Production of Grain Sorghums." *Agron. J.* 55:182-185.
- [1963b]. *Weather and Technology in the Production of Corn and Soybeans*. Iowa State University, Center for Agricultural and Economic Development, Report 17.
- [1966]. *Weather Variability and the Need for a Food Reserve*. Iowa State University, Center for Agricultural and Economic Development, Report 28.
- Thompson, R. G. [1963]. "Discussion: Probability Sampling in Collecting Farm Data." *J. Farm Econ.* 45:1520-1521.
- Timm, T. R. [1966]. "Proposals for Improvement of the Agricultural Outlook Program of the United States." *J. Farm Econ.* 48:1179-1184.
- Todd, A. S., Jr., and J. J. Ziricle, Jr. [1952]. "A Test of Survey Methods for Estimating Stumpage Prices." *Agr. Econ. Res.* 4:115-125.
- Tostlebe, A. S. [1957]. *Capital in Agriculture: Its Formation and Financing since 1870*. Princeton: Princeton University Press.

- Tostlebe, A. S., D. C. Horton, R. J. Burroughs, H. C. Larsen, L. A. Jones, A. R. Johnson, and N. J. Wall [1945]. *Impact of the War on the Financial Structure of Agriculture*. USDA Miscellaneous Publication 567.
- Trelogan, H. C. [1962]. "To Acquire and Diffuse Information." *Agricultural Statisticians in a Changing World*. National conference, Statistical Reporting Service.
- [1963]. "The Changing World for Agricultural Statistics." *J. Farm Econ.* 45: 1500-1506.
- [1966]. "Progress with New Techniques in U.S. Agricultural Estimates." Paper presented at the Dominion Bureau of Statistics Federal-Provincial Conference, Ottawa, Canada, February 22.
- [1968a]. "Cybernetics and Agriculture." *Agr. Econ. Res.* 20:77-81.
- [1968b]. "Agricultural Statistics in the Next Decade." In *Proceedings of the Statistical Reporting Service Conference*. USDA, SRS.
- [1971]. "Implications of the Census for Agricultural Statistics." *Am. J. Agr. Econ.* 53:910 (abstract).
- [1972]. "Future Census Data for Agriculture: Reply." *Am. J. Agr. Econ.* 54:363.
- Truesdell, L. [1949]. "The Development of the Urban-Rural Classification in the United States, 1874 to 1949." In *Current Population Reports, Population Characteristics, Series P-23, No. 1*.
- Tsai, R. [1973]. "A Method for Correcting the Bias Due to Nonresponse in a Mail Survey." In *Abstracts Booklet, ASA*, pp. 130-131.
- Tweeten, L. G., and J. E. Martin [1966]. "A Methodology for Predicting U.S. Farm Real Estate Price Variation." *J. Farm Econ.* 48:378-393.
- Tweeten, L. G., and T. R. Nelson [1970]. *Sources and Repercussions of Changing U.S. Farm Real Estate Values*. Oklahoma Agricultural Experiment Station Technical Bulletin T-120.
- United Nations [annual]. *Statistical Yearbook*.
- [1968]. *A System of National Accounts: Studies in Methods*. Series F, No. 2. New York.
- United Nations, FAO [annual]. *Yearbook of Food and Agricultural Statistics*.
- [1954]. *World Pulp and Paper Resources and Prospects*.
- [1973]. *Provisional Handbook of Economic Accounts for Agriculture*. Rome.
- United Nations, FAO, and Inter-American Statistical Institute [1971]. *Economic Accounts for Agriculture*. Report of the 6th Session, Subcommittee on Agricultural Statistics, Washington, D.C.
- United Nations, World Food Conference [1974]. *Assessment of the World Food Situation: Present and Future*. Item 8 of the Provisional Agenda, Rome.
- U.S. Congress [1952]. *Crop Estimating and Reporting Services of the Department of Agriculture*. Report and recommendations of a special subcommittee, 82nd Congress, 2nd Session, House of Representatives, Committee Print.
- [1959]. *Water Resource Activities in the United States: Land and Water Potentials and Future Requirements for Water*. Senate Select Committee on National Water Resources, 86th Congress, 1st Session, Committee Print 12.
- [1960]. *Department of Agriculture Appropriations for 1960*. Hearings before the Subcommittee of the Committee on Appropriations, House of Representatives, Subcommittee on Department of Agriculture and Related Agencies, 86th Congress, 1st Session. Part 1, pp. 85-250.
- [1967a]. *Parity Returns Position for Farmers*. Senate Document 44, 90th Congress, 1st Session.

- [1967b]. *The Coordination and Integration of Government Statistical Programs*. Hearings before the Subcommittee on Economic Statistics, Joint Economic Committee, 90th Congress, 2nd Session.
- [1971]. *The Economic and Social Condition of Rural America in the 1970's*. Senate Committee on Government Operations, 1st Session. Parts, 1, 2, 3.
- [1972]. *Investigation of Possible Politicization of Federal Statistical Programs*. Subcommittee on Census and Statistics of the House Committee on Post Office and Civil Service, 92nd Congress, 2nd Session, House Report 92-1536.
- [1973]. *Agriculture and Consumer Protection Act of 1973, Export Sales Reporting, Sec. 812*. 93rd Congress, 1st Session.
- U.S. Congress, House Appropriations Committee [1957]. *Hearings on the Department of Agriculture Appropriations for 1958*. Subcommittee on Appropriations, Part II, pp. 886-894.
- U.S. Congress, Joint Economic Committee [1974]. *Government Price Statistics*. Hearings before the Subcommittee on Economic Statistics of the Joint Economic Committee, 87th Congress, 1st Session. Part 1.
- U.S. Congress, Office of Technology Assessment [1976a]. *Food Information Systems—Summary and Analysis*. Office of Technology Assessment OTA-F-35.
- [1976b]. *Food Information Systems: Hearings before the Technology Assessment Board of the Office of Technology Assessment*.
- USDA [annual]. *Changes in Farm Production and Efficiency: A Summary Report*. Statistical Bulletin 233.
- [1924]. *Yearbook of Agriculture, 1923*.
- [1939]. *Food and Life: Yearbook of Agriculture, 1939*.
- [1957-72]. *Major Statistical Series of the U.S. Department of Agriculture—How They are Constructed and Used*. Agriculture Handbook 118 (vols. 1-9, 1957); Agriculture Handbook 365 (revised and updated editions of vols. 1-9, 1969-72; vols. 10 and 11, 1972).
- [1957, 1970]. *Vol. 1, Agricultural Prices and Parity*.
- [1957, 1970]. *Vol. 2, Agricultural Production and Efficiency*.
- [1957, 1969]. *Vol. 3, Gross and Net Farm Income*.
- [1957, 1970]. *Vol. 4, Agricultural Marketing Costs and Charges*.
- [1957, 1972]. *Vol. 5, Consumption and Utilization of Agricultural Products*.
- [1957, 1971]. *Vol. 6, Land Values and Farm Finance*.
- [1957, 1969]. *Vol. 7, Farm Population, Employment and Levels of Living*. (In the 1969 edition the title was revised to *Farm Population and Employment*.)
- [1957, 1971]. *Vol. 8, Crop and Livestock Estimates*.
- [1957, 1970]. *Vol. 9, Farmer Cooperatives*.
- [1972]. *Vol. 10, Market News*.
- [1972]. *Vol. 11, Foreign Trade, Production and Consumption of Agricultural Products*.
- [1958]. *The Federal and State Agricultural Outlook Service*.
- [1959]. *Agricultural Estimating and Reporting Services of the United States Department of Agriculture*. Miscellaneous Publication 703.
- USDA, AMS [1955]. *Measuring the Supply and Utilization of Farm Commodities: New Indices, 1922-54*. Agriculture Handbook 91.
- [1957]. *A Program for the Development of the Agricultural Estimating Service*.
- [1960]. *Uses of Marketing Information by Farmers in Michigan*. AMS-418.

- USDA, AMS, and Bureau of the Census [1958]. *Farmers' Expenditures in 1955, by Regions, for Production and Farm Living with Tables on Off-Farm Income*. Statistical Bulletin 224.
- USDA, ARS [1957a]. *Dietary Levels of Households in the United States, Spring*. Household Food Consumption Survey, 1955, Report 6.
- [1957b]. *Fertilizer Used on Crops and Pasturelands in the United States*. Statistical Bulletin 216.
- [1958]. *Farm Costs and Returns, Commercial and Family-Operated Farms*. Agriculture Information Bulletin 196.
- [1960]. *Farm Costs and Returns: Commercial Farms by Type, Size, and Location*. Agriculture Information Bulletin 230 (annual revisions).
- [1969]. *Dietary Levels of Households in the United States, Spring 1965*. Household Food Consumption Survey, 1965-66, Report 6.
- [1972]. *Food and Nutrient Intake of Individuals in the United States, Spring 1965*. Household Food Consumption Survey, 1965-66, Report 11.
- USDA, BAE [1949]. *Consumption of Food in the United States, 1909-48*. Miscellaneous Publication 691.
- [1953]. *Consumption of Food in the United States*. Agriculture Handbook 62.
- USDA, Bureau of Human Nutrition and Home Economics [1944]. *Family Food Consumption in the United States, Spring 1942*. Miscellaneous Publication 550.
- [1949]. *Nutritive Value of Diets of Urban Families, United States, Spring 1948, and Comparison with Diets in 1942*. Food Consumption Surveys, 1948, Preliminary Report 12.
- USDA, Conservation Needs Inventory Committee [1971]. *Basic Statistics: National Inventory of Soil and Water Conservation Needs, 1967*. Statistical Bulletin 461.
- USDA, ERS [annual]. *Farm Real Estate Taxes—Recent Trends and Developments*.
- [1962-72]. *Farm Costs and Returns: Commercial Farms by Type, Size and Location*. Agriculture Information Bulletin 230 (annual revisions).
- [1962]. *Farm Population—Revised Estimates for 1941-59*. ERS-90.
- [1963]. *Agriculture and Economic Growth*. Agricultural Economic Report 28.
- [1964]. *World Food Budget to 1970*. Foreign Agricultural Economic Report 19.
- [1965]. *U.S. Food Consumption: Sources of Data and Trends, 1909-63*. Statistical Bulletin 364.
- [1966]. *Agricultural Markets in Change*. Agricultural Economic Report 95.
- [1968]. *National Food Situation*. NFS-125.
- [1970]. *Marketing America's Food*. Report 446 (revised 1972).
- [1972a]. *Changes in Farm Production and Efficiency*. Statistical Bulletin 233.
- [1972b]. "Farm Income and Capital Accounting—Findings and Recommendations of a 1972 ERS Task Force." Unpublished report.
- [1972c]. *Productivity: Index of Total Farm Output and Productivity for Each Farm Production Region, 1939-71*. Statistical Bulletin 233, supplement 5.
- [1973a]. *Marketing Economics Research Publications*. Report 205.
- [1973b]. *Selected U.S. Crop Budgets, Yields, Inputs and Variable Costs*. Vol. 1, Southeast Region, Report 457. Vol. 2, North Central Region, Report 458. Vol. 3, Great Plains Region, Report 459. Vol. 4, Northwest Region, Report 460. Vol. 5, South Central Region, Report 461. Vol. 6, Southwest Region, Report 514.
- [1975]. *The Food and Fiber System—How it Works*. Agriculture Information Bulletin 383.
- USDA, FCA [1968]. *Production Credit Associations and their Loans*. Bulletin CR-10.

- USDA, Forest Service [annual]. *The Demand and Price Situation for Forest Products*. Miscellaneous Publications 953 (1963), 983 (1964), 1009 (1965), 1045 (1966), 1066 (1967), 1086 (1968-69), 1165 (1969-70), 1195 (1970-71), 1231 (1971-72), 1239 (1972-73), 1292 (1973-74), 1315 (1974-75).
- [1958]. *Timber Resources for America's Future*. Forest Resource Report 14.
- [1965]. *Timber Trends in the United States*. Forest Resource Report 17.
- [1974]. *Outlook for Timber in the United States*. Forest Resource Report 20.
- USDA, Interbureau Coordinating Committee on Postwar Planning [1945a]. *What Peace Can Mean to American Farmers: Post-war Agriculture and Employment*. Miscellaneous Publication 562.
- [1945b]. *What Peace Can Mean to American Farmers: Maintenance of Full Employment*. Miscellaneous Publication 570.
- [1945c]. *What Peace Can Mean to American Farmers: Expansion of Foreign Trade*. Miscellaneous Publication 582.
- [1945d]. *What Peace Can Mean to American Farmers: Agricultural Policy*. Miscellaneous Publication 589.
- USDA, PMA [1947]. *Conversion Factors and Weights and Measures for Agricultural Commodities and Their Products*. Mimeo.
- USDA, SCS [1958, 1967]. *A National Inventory of Soil and Water Conservation Needs*. Revised 1967.
- [1971]. *Soil Survey, Orange County, Virginia*. Prepared in cooperation with Virginia Agricultural Experiment Station.
- [1972]. *List of Published Soil Surveys*.
- USDA, SRS [quarterly]. *Pig Crop Report*.
- [1964, 1975]. *Scope and Methods of the Statistical Reporting Service*. Miscellaneous Publication 967 (1964); revision issued as Miscellaneous Publication 1308 (1975).
- [1967]. *Crop and Livestock Estimates*.
- [1969]. *The Story of U.S. Agricultural Estimates*. Miscellaneous Publication 1088.
- [1971a]. "Changes in the Program of Reports for Field, Fruit and Nut Crops." *Crop Estimates Memorandum* 1715. Mimeo.
- [1971b]. "Changes in the Program of Reports for Livestock, Dairy and Poultry." *Crop Estimates Memorandum* 1720. Mimeo.
- [1972]. "Program Modifications for Fresh Market and Processing Vegetables and Potatoes." *Crop Estimates Memorandum* 1728.
- U.S. Department of Commerce [1954]. *Readings in Concepts and Methods of National Income Statistics*.
- U.S. Department of Commerce, Bureau of the Census [quinquennial]. *Census of Agriculture*. Vols. 1, 2, 3, 1974, and earlier issues.
- [1953]. *Revised Estimates of the Farm Population of the United States, 1910-1950*. Farm Population Series, Census-BAE 16.
- U.S. Department of Commerce, Bureau of Economic Analysis, Interindustry Economics Division [1974]. "The Input-Output Structure of the U.S. Economy: 1967." *Survey of Current Business* 54(2):24-56.
- U.S. Department of Commerce, Intensive Review Committee [1954]. *Appraisals of Census Programs*.
- U.S. Department of Commerce, Office of Business Economics, National Economics Di-

- vision [1969]. "Input-Output Structure of the U.S. Economy: 1963." *Survey of Current Business* 49(11):16-47.
- U.S. Department of Commerce, Weather Bureau [1963]. *Selective Guide to Published Climatic Data Sources, Prepared by the U.S. Weather Bureau.*
- U.S. Department of Health, Education, and Welfare [1976]. *Summary Report: Rural Income Maintenance Experiment: A Social Experiment in Negative Income Taxation.* Sponsored by the Office of Economic Opportunity and the Department of Health, Education, and Welfare.
- U.S. Department of the Interior, Bureau of Outdoor Recreation [1971]. *Selected Outdoor Recreation Statistics.*
- U.S. Department of the Interior, Geological Survey. *Periodic Circular Series on Estimated Use of Water in the United States.* Same title: Circular 115, 1950; Circular 398, 1955; Circular 456, 1960; Circular 556, 1965.
- [1964]. *Long-Range Plan for Resource Surveys: Investigations and Research Programs of the United States Geological Survey.*
- U.S. Department of Labor, BLS [1959]. *Trends in Output per Man-Hour in the Private Economy, 1909-58.* Bulletin 1249.
- [1974]. *Indexes of Output per Man-Hour.* Bulletin 1827.
- U.S. Federal Reserve System, Board of Governors [1964]. *Farm Debt—Data from the 1960 Sample Survey of Agriculture.*
- U.S. Government [1971]. *Federal Statistics: Report of the President's Commission.* Vol. 1, Report. Vol. 2, Supporting Papers and Documents.
- U.S. Interstate Commerce Commission, Investigation and Suspension Docket 7656 [1963]. *Grain in Multiple-car Shipments—River Crossings to the South.* Decided January 21, 1963; service date, January 1964.
- U.S. Office of Management and Budget, Statistical Policy Division [1974]. *Standard Industrial Classification Manual, 1972.*
- U.S. Water Resources Council [1968]. *The Nation's Water Resources: The First National Assessment of the Water Resources Council.*
- [1969]. *The Water Use Data Base: The Report of the Task Force on Water Use Data to the Planning Committee of the Water Resources Council.*
- [1970]. *Water Resources Regions and Subregions for the National Assessment of Water and Related Land Resources.*
- University of New Brunswick, Department of Surveying Engineering [1968]. *Proceedings of a Symposium on Land Registration and Data Banks.*
- Upchurch, M. L. [1974]. "Toward a Better System of Data for the Food and Fiber Industry." *Am. J. Agr. Econ.* 56:635-637.
- [1977]. "Developments in Agricultural Economic Data." (See the table of contents in this volume.)
- Van Dress, M. G. [1971]. *The Food Service Industry: Type, Quantity, and Value of Foods Used.* USDA Statistical Bulletin 476.
- Van Vuuren, W. [1968]. *Agricultural Land Prices and Returns in an Advanced Urban and Industrial Economy.* Unpublished Ph.D. dissertation, University of California, Berkeley.
- Veblen, T. [1914]. *The Instinct of Workmanship and the State of the Industrial Arts.* New York: Kelley.
- Vickery, R. E. [1956]. "An Appraisal of Interview Procedures in Farm Surveys." *Agr. Econ. Res.* 8:59-65.

- Vincent, W. H. [1959]. "A Farm Panel as a Source of Income and Expenditure Data." *Agr. Econ. Res.* 11:97-102.
- Vining, R. [1953]. "Delimitation of Economic Areas: Statistical Conceptions in the Study of the Spatial Structure of an Economic System." *J. Am. Stat. Assoc.* 48: 44-61.
- Virginia Conservation Needs Inventory Committee [1970]. *Virginia Conservation Needs Inventory of 1967*. Virginia Polytechnic Institute, Extension Publication 384.
- Vlasin, R. D. [1973]. "Substate Regions—Issues and Data Implications." Paper prepared for AAEA Task Force on Social and Economic Statistics.
- Vlasin, R. D., L. W. Libby, and R. L. Shelton [1975]. "Economic and Social Information for Rural America: Priorities for Immediate Improvement." *Am. J. Agr. Econ.* 57:900-909.
- Voelker, S. W. [1969]. *Selected Publications on County Government Services and Costs of Particular Interest to the Great Plains States*. North Dakota State University, Agricultural Economics Miscellaneous Report 3.
- Vogel, F. A. [1973]. "An Application of a Two-Stage Multiple Frame Sample Design." In *Abstracts Booklet*, ASA, p. 132.
- [1975]. "Surveys with Overlapping Frames—Problems in Application." In *Abstracts Booklet*, ASA, pp. 162-163.
- Wales, H. G., and R. Ferber [1956]. *A Basic Bibliography on Marketing Research*. American Marketing Association, Bibliography Series 2.
- [1963]. *A Basic Bibliography on Marketing Research*. Second edition. American Marketing Association.
- Walker, F. A. [1883]. *Land and Its Rent*. Boston: Little, Brown.
- Wallace, D. [1955]. "A Case for and against Mail Questionnaires." *Public Opinion Quarterly* 18:40-52.
- Waugh, F. V. [1964]. *Demand and Price Analysis*. USDA Technical Bulletin 1316 (reprinted 1970).
- Webb, L. M. [1956]. "Discussion: The Need for an Expanded Price Research Program." *J. Farm Econ.* 38:390-394.
- Weeks, E. E. [1970]. *The Agriculture Industry*. National Agricultural Outlook Conference, Washington. Processed.
- [1971a]. *Aggregate National Agricultural Data—Status and Alternatives*. USDA, ERS Progress Report.
- [1971b]. "The Data Problem in Agricultural Economics Research." *Am. J. Agr. Econ.* 53:911 (abstract).
- [1972]. "The Concept and Measurement of Farm Income and General Welfare in Agriculture." *Western Agr. Econ. Assoc. Proceedings*, pp. 259-266.
- Weeks, E. E., T. Carlin, C. Cobb, J. Mikesell, P. Nelson, and A. Smith [1972]. *Farm Income and Capital Accounting—Findings and Recommendations of a 1972 ERS Task Force*. USDA, ERS, unpublished.
- Weeks, E. E., G. E. Schluter, and L. W. Southard [1974]. "Monitoring the Agricultural Economy: Strains on the Data System." *Am. J. Agr. Econ.* 56:976-983.
- Weiner, N. S. [1974]. "The Report of the President's Commission on Federal Statistics: A Summary of Recommendations, Views, and Counterviews." *Am. Statistician* 28:42-46.
- Weisgerber, P. [1971]. *Commercial Wheat Production: World Market, U.S. Production Centers, Costs and Returns Analysis*. USDA, ERS Report 480.

- Wells, O. V. [1942]. "America's Changing Food Consumption, 1909-41." *J. Home Econ.* 34:463-467.
- [1950]. "Agricultural Statistics as an Aid to Research, Service, and Administration." *J. Farm Econ.* 32:858-864.
- [1958]. "Agricultural Statistics in a Changing World: Adapting Data to New Conditions." *J. Farm Econ.* 40:1214-1227.
- [1961]. "Discussion: How Well Do the Economic Indicators Indicate What Is Happening in the Major Sectors of the Economy?" *J. Farm Econ.* 43:459-461.
- Wells, O. V., J. D. Black, P. H. Appleby, H. C. Taylor, H. R. Tolley, R. J. Penn, and T. W. Schultz [1954]. "The Fragmentation of the BAE." *J. Farm Econ.* 36:1-21.
- Welsch, D. E., and D. S. Moore [1965]. "Problems and Limitations Due to Criteria Used for Economic Classification of Farms." *J. Farm Econ.* 47:1555-1564.
- Wessel, R. I. [1963]. "Can County Government Costs Still Be Reduced?" *Iowa Farm Science* 18:25-27.
- West, V. I. [1965]. "Discussion: Sampling Frames for Collection of Agricultural Statistics." *J. Farm Econ.* 947:1539-1541.
- Westcott, G. W. [1956]. "Discussion: Agricultural Data Requirements in Extension Work." *J. Farm Econ.* 38:1468-1470.
- White, J. H. [1964]. "Discussion: Statistical Bottlenecks to Econometric Analysis." *J. Farm Econ.* 46:1410-1414.
- White, J. P., ed. [1968]. *Proceedings of a Workshop on Problems of Improving the United States System of Land Titles and Records*. Indianapolis Law School, Indiana University and Purdue University. Processed.
- Wickens, A. J. [1953]. "Statistics and the Public Interest." *J. Am. Stat. Assoc.* 48:1-14.
- [1954]. "Prospects for a Federal Statistical System in the U.S." *Am. Statistician* 8(4):12-16.
- Wigton, W. H., and W. E. Kibler [1972]. "New Methods for Filbert Objective Yield Estimation." *Agr. Econ. Res.* 24:37-46.
- Wilcox, E. C. [1956]. "Local Data Requirements in Areas of High Agricultural Specialization." *J. Farm Econ.* 38:1455-1468.
- Wilcox, E. C., and W. H. Ebling [1949]. "Presentation of Agricultural Data in the States." *J. Farm Econ.* 31:309-322; L. M. Carl, "Discussion," pp. 322-324.
- Williams, W. F., E. K. Bowen, and F. G. Genovese [1959]. *Economic Effects of U.S. Grades for Beef*. USDA Marketing Research Report 298.
- Williams, W. H., and C. L. Mallows [1970]. "Systematic Biases in Panel Surveys." *J. Am. Stat. Assoc.* 65:1338-1349.
- Winkler, O. [1963]. "A New Approach to 'Measuring' Agricultural Production." *J. Am. Stat. Assoc.* 58:564 (abstract).
- Wollman, N., and G. W. Bonem [1971]. *The Outlook for Water: Quality and National Growth*. Baltimore: Johns Hopkins University Press.
- Wooten, H. H., and J. R. Anderson [1957]. *Major Uses of Land in the United States*. USDA Agriculture Information Bulletin 168.
- Worswick, G. D. N. [1972]. "Is Progress in Economic Science Possible?" *Econ. J.* 82: 73-79.
- Woytinsky, E. S., and W. S. Woytinsky [1939]. "Progress of Agricultural Statistics in the World." *J. Farm Econ.* 21:761-787.

- Wright, B. H., and R. E. Torgerson [1975]. "Reporting Cash Grain Prices: Issues and Their Possible Resolution." Contributed paper presented at the AAEE annual meeting, Columbus, Ohio.
- Zusman, P. [1967]. "A Theoretical Basis for Determination of Grading and Sorting Schemes." *J. Farm Econ.* 49:89-106.

Epilogue

Epilogue

The chapters in this volume emphasize the importance of more fully integrating the array of various quantitative approaches to problem solving and to the testing of theoretical constructs. Whether approached from an econometric, optimization, systems and simulation standpoint, or from a more pragmatic data-dredging standpoint, the applied problems of agricultural economics require specialized analysis if they are to be handled effectively. Accordingly, the authors of each of the chapters look toward the day when the apparently separate tasks associated with problem-oriented research will be more fully and effectively integrated. The compartmentalization typical in the profession and emphasized by the organization of the volume seems more and more artificial as the quantitative methods and approaches to data generation are viewed in their modern and/or generalized forms.

The review of econometric methods by Judge concludes with an evaluation of estimation techniques which support the theme of integration. The various forms of preliminary testing and Stein-rules, Bayesian estimation and inference, adaptive estimation, updating, and variational parameter procedures are all econometric techniques which recognize and emphasize the specialization of method to the problem at hand. Moreover, they point toward a need for the integration of research tasks associated with data gathering, model revision, and applications in policy or optimizing contexts. For example, variational parameter estimation methods are consistent with evolutionary problem specifications and a variety of schemes for obtaining data. Similarly,

the comparatively recent results on preliminary tests and adaptive model construction have done much to formalize and lend scientific content to methods of analysis long practiced by applied researchers. Although the results in this instance are somewhat discouraging regarding the information content of the adaptively or sequentially constructed models, they do underline the value of optimizing methods for model revision, the collection of additional data, and policy applications. These methods are at present somewhat demanding computationally and even conceptually, but they indicate the direction in which the modern developments in econometrics are moving.

Day's chapter on the conceptual background of economic optimization is on the surface somewhat less suggestive of the integration theme. Technical aspects of modern optimization methods and problems or structures are surveyed in an expository manner. The connection of these models or methods with economic systems such as market processes and their extensions to dynamic frameworks are key features which support the general theme. Throughout the chapter the reader is reminded that the model, however elegant, is not an end in itself; rather, it is formulated for a specific purpose—to study an economic system. Correspondingly, as perceptions of the economic system being modeled change, perhaps through use of the model itself, the optimizing models can be altered in such a fashion as to capture more accurately or economically those aspects of the problem of interest to the researcher.

Day's chapter also delineates several types of dynamic optimizing models. With command of these formal dynamic optimizing structures, it is natural to initiate the process of formalizing the procedures for model revision to comply with added or developed perspective on the economic system in question. Potential variables for broadly conceived optimizing models are designs for data generation and estimation methods and again must incorporate in an integral fashion the other quantitative approaches and/or problems considered in this volume.

The review of applications of optimizing methods by Day and Sparling surveys past studies and presents a few speculations on directions for future research. The studies are categorized by food and diet, farm and business management, farm development, production response, spatial economies, natural resources, and development. The chapter highlights original contributions or studies which represent the first attempt at the systematic application of optimizing techniques to the selected problem areas. As in the preceding chapters, several methods applied to complex problems which are demanding from a computational viewpoint are identified as important milestones in the evolution of results on optimization methods. Of the applications reviewed, the resource models possibly come the closest to achieving an integra-

tion of quantitative techniques along the data-estimation-optimization focus of the present discussion. Attempts to cope with uncertainty about the initial conditions and the economic structure, along with the intrinsic dynamic nature of these problems, place this work in the forefront of advanced modeling applications. Similar problems arise in the construction of models for farm growth management. Largely because of the readily available traditional linear programming methods, however, generalization to an integrated approach was limited by the failure early in the research efforts to formulate the problem in a truly dynamic context.

Woodworth's chapter reviews the extensive theoretical and applied work on production functions. The chapter thus concentrates more on an area of economic substance than on analytical methods or data. For this reason the review is less integrated into the present discussion than are the other chapters. The research on production functions is, however, an area in which theory, data, and estimation methods have been effectively combined. The evolution of specifications to more generalized forms, allowing for variation in the elasticity of substitution, linkages of these models to input-output relationships in fixed coefficient forms, questions of appropriate levels and methods of aggregation, and the estimation of parameters incorporating firm equilibrium conditions are identified as important developments and avenues for further study. As shown by the review, much of the original work in applying and estimating production functions has been done in agricultural economics. For the United States applied activity in this area peaked in the late 1950s and early 1960s, owing in some respects to the adoption of the major concepts in production theory by the technical scientists generating the data (a factor useful in explaining the continued work on estimating production functions in developing economies) and perhaps because the specifications of the models and uses have focused on comparative statics. Following the theme of the earlier comments on adaptive modeling, it would seem apparent that interest in production functions will be renewed when dynamic models of firm behavior are made more complete and accompanying evolutionary specifications for the associated technical relationships are required.

The review of systems and simulation procedures and analyses by Johnson and Rausser focuses on the importance of systematizing the processes of model development, estimation, and application and choice. The initial sections of the chapter provide a framework for integrating these processes and identify their connection with the modern work on adaptive control. Systems and simulation are shown to have been useful in stimulating more general approaches to methods of model construction and application. It is also shown that the implicit optimizing context in which purposeful model development and application are viewed calls for much more structured approaches to the

problems of verification, validation, estimation, operation, and revision. A major limitation of the applied work in systems and simulation has been the highly personalized nature of the models. The chapter concludes with a survey of applications, concentrating on those which have been innovative in method and in the formalization of model construction and application processes.

The remaining chapters are a collection of essays on data systems, including their history and implications for future research. Upchurch provides a fairly complete survey of sectorwide data systems. He emphasizes that the various data systems have been typically initiated in response to particular economic problems. Farm surveys and commodity statistics which arose from policy problems faced during the depression years, costs and returns studies to support parity programs, and the more recent concerns with rural development are examples of instances in which data systems have been initiated or greatly expanded in response to an agricultural problem requiring centralized policy action.

From the present perspective this unstructured approach to data collection and the development of an information base for the agricultural sector may seem unfortunate. But is it reasonable to expect anything else? Data and information are expensive, so choices must be made on the bits of information to be included in the system. Current policy problems dictate the relevance of the various existent and possible data systems. These problems tend to change in unpredictable ways. This being the case, it is likely that researchers will continually be dissatisfied with the existing base. What will happen is largely what has happened in the past. The information system will continue to evolve very slowly and adapt to the information needs of the data users, with some improvement in the communication between the people who collect the data and those who use it for research or decision-making purposes.

Trelogan and his associates chronicle the history, evolution, and present status of the Statistical Reporting Service of the USDA. Again the emphasis is on the development and extension of the SRS data system in response to perceived policy problems at the national level. More specifically, the extensions have occurred largely in response to administrative and governmental program needs—for example, the need for data to monitor and implement the various types of governmental programs for agriculture which have been applied over the years.

Of particular interest in this chapter are the observations made on new technologies for data gathering and handling. Advances in multiframe sampling theory, along with the accumulated knowledge on the population, have made possible the development of more reliable estimates for the recorded features of the sector of the economy and the units within it. Similarly, tech-

nological advances in data processing have resulted in the cost feasibility of handling and maintaining a much more ambitious data base. Many important possibilities associated with linking data systems on a real-time basis are still to be explored. As these possibilities are recognized and exploited, data systems may begin to focus more on the information content and the economic and social returns of having the information and less on the costs of collection. Finally, remote sensing holds great potential for reducing costs of data gathering. For example, worldwide crop acreage inventories obtained on essentially a real-time basis seem at present almost within our technological grasp. It is interesting to note that remote sensing as applied in modeling has also developed just as the need for policies more effectively linking the agricultural sector to world food and fiber markets has emerged as a major concern in the efficient and purposeful functioning of the sector. Although of course dependent on space technology, the process of obtaining information for more accurately modeling world food production, stocks, and consumption patterns can be viewed as a response of the data system to recent major policy issues involving population dynamics and economic development.

Bonnen explicitly treats the data gathering, storage, and discrimination processes as an evolving system. Problems with the data base, Bonnen argues, are best approached by recognizing that the essential features of the process can be viewed in an information systems context. He stresses that data systems involve management and operationalization of economic concepts, along with institutional and statistical theory. Moreover, data systems feed into a larger structure termed an inquiry system. The scope and content of the inquiry system is to a large extent defined by the informational needs and requirements of the various agricultural decision makers. Within this process we can readily envisage changes in data-gathering techniques, in data base management, and in the focuses for the basic sampling or recording endeavors. It is important that the information system serve current policy needs. Various hallowed data series or concepts on which data gathering has been focused should not be automatically perpetuated. The costs and benefits of the different types of information which can be obtained—not tradition and vested interest—should guide the system. For agriculture, Bonnen argues that vested interest groups have made the data system less flexible than it might otherwise have become. The optimal economic framework for positioning the data or information system must balance benefits and costs on a continual basis, emphasizing the advantages of more accurate or more complete information in existing and contemplated research activities.

The observations made by Bryant in the essay on economic and social statistics for rural people are quite consistent with our general theme and with the chapter on data systems by Bonnen. Specialized experiments on a grand

scale are strongly suggested as useful approaches to the generation of data needed for fruitful studies of rural development. Moreover, Bryant recommends the collection of more secondary data on rural populations and economies to support the research suggested by modern development policies. Thus, Bryant's remarks, in the context of the general theme and Bonnen's comments on information systems, are easily understood, given the recent attention of the profession to rural development problems. Bryant's chapter provides a good example of how the process of reorienting and expanding data or information systems occurs in response to changing theoretical concepts with respect to human capital, household production theories, and so on and in response to changing economic problems and policy questions. It is unfortunate that this response cannot be more timely and less costly, but these characteristics are symptomatic of the major decisions on information trade-offs that such changes imply.

Since the systems and simulation chapter necessarily addresses the gamut of activities associated with model development, specialization for applied problems and use, it has anticipated a number of our overall concluding comments. Systems concepts have proved very useful in understanding and modeling highly complex structures. Johnson and Rausser emphasize what has been implicit in all of the chapters—namely, the importance of clearly identifying the purposeful intent of research in developing models and of corroborating the models with the system vis-à-vis data collection and information processing and applying this acquired knowledge in a descriptive, behavioral, forecasting, or decision context. In this regard, it has been illustrated that the theory of adaptive or dual control provides a framework sufficiently general to unify the modeling and research process. With systems concepts and the adaptive control framework, the compartmentalization of quantitative research and teaching processes such as estimation, data gathering, and optimization can be discarded.

Modeling activities and, in fact, research in general involve implicit optimizing processes. Models are constructed and research is conducted with implicit or explicit purposeful intent. Moreover, there are natural and identifiable constraints associated with the modeling process itself and of course with the system under study. Thus, research efforts, whether related to model formulation or to application in a policy context, have identifiable objectives which are approached by strategies for allocating scarce resources. Users of this framework view choices of estimation method, data collection, verification and validation procedures, and analytical construct as potential control variables in a general optimizing process.

The evolutionary nature of the research process underscores the importance and use of the adaptive control framework in guiding and specializing

research, which is by design a search and discovery process. Consequently, at various points in the research process increased knowledge of the system in question puts the decision maker in an improved position for identifying the relevant instrument variables and setting optimizing levels of controlled activities. This together with the observation that the agricultural sector and the subunits within it are in a state of continual change further underscores the importance of electing an approach to research activities which can accommodate and adapt to evolutionary processes. Changes in the system, perceived problems, data systems, methods of analysis, and the like are more the rule than the exception and thus require an adaptive mode for decisions regarding research activities.

Agricultural economics has been heavily influenced by the neoclassical paradigm in economics and classical statistical decision theory. Both are constructs which abstract from the evolutionary nature of the processes, economies, agents, and managerial participants interacting with the system under examination. Perhaps this has caused the profession to look too much for "the" optimal data systems and has led to inflexible models and optimization methods which in many cases require perfect knowledge and foresight. Developments in systems and simulation and within the statistical and optimization methods and information processing areas have shown the frailty of these concepts. Such developments argue for a more realistic characterization of the present state of knowledge and for more adaptive research strategies. The world is changing and our perceptions of it are being revised as a result of passive and manipulative intervention in the various subsystems.

The reviews in this volume have stressed that data systems, methods of model construction, model use, and research strategies which do not recognize the integrative features of the information generation process are often ineffective and inefficient. Nevertheless, the progress toward estimation and optimization methods and data generation systems which are more attuned to the evolutionary nature of research problems and activities is reflected in each review.

