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## Book Reviews

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*Introduction to Mathematical Economics.* By D. W. Bushaw and R. W. Clower. Richard D. Irwin, Inc., Homewood, Illinois. 345 pages. 1957. \$7.

IF I have a message to send, I prefer the telegraph to the wheelbarrow." This title page quotation from Emerson sets the tone for Bushaw and Clower's *Introduction to Mathematical Economics*. "Mathematics," said the American physicist Gibbs, "is a language." Bushaw and Clower add that it may therefore be taught as a language may be taught—by reading it, by speaking or writing it, and with minimum attention to grammar, syntax, and vocabulary.

The author's purpose ". . . is to provide an introductory account of mathematical methods of economics analysis which is accessible to persons with a limited training in mathematics." The method used to accomplish this purpose is one resembling the "Berlitz" method of teaching a foreign language. From the beginning, the student is given a text in the unfamiliar language. Information about the grammar, syntax, and vocabulary of mathematics is relegated to special sections at the end of the book.

The "reading" which the authors have chosen to present is a mathematical account of the modern theory of price determination. Macroeconomic statics and dynamics (market supply and demand) are discussed at length. Emphasis is placed on the distinction between pure flow models, pure stock models, and stock-flow models.

This emphasis is of recent vintage in the literature. It leads directly to dynamic considerations. These are discussed extensively with emphasis on the stability of macrodynamic models. The microeconomic theories of consumer and business behavior are discussed less fully, though adequately. Walrasian general equilibrium models are discussed only briefly.

The chapters on necessary mathematics take up slightly more than a third of the book. They include a terse and somewhat incomplete account of elementary calculus, determinants and quadratic forms, and difference and differential equations. The material on the stability of difference and differential equations is not really adequate

for a full appreciation of the problems involved, especially since such great emphasis is placed on this type of problem in the earlier discussion of macrodynamics.

Unfortunately, mathematics is not just a language; if it were, many of us would have an easier time with it. It is a complex logical structure of great abstraction. Translation from one language to another does not involve passing from one level of abstraction to another, but the application of mathematics to economics does. A reasonably full understanding of an area of mathematics is needed before the student can master the application of a theorem or two in economics. The extent and depth of the mathematical chapters in Bushaw and Clower are not sufficient to give the student a full appreciation of the application of mathematics to economics. Several courses in pure mathematics as well as some outside reading on more "esoteric" topics (such as the stability theory of differential equations<sup>1</sup>) are needed.

Although the book will not serve as a good text for students who have had little or no mathematics beyond high school algebra, it will make an interesting and instructive text for students who have had mathematics through elementary differential equations. One semester course could be planned around the "reading" on the modern theory of price determination, with the suggestion that the student review the fundamental mathematics in the last third of the book on his own. If a second semester were planned, a series of topics taken from Allen's recent *Mathematical Economics* could be selected.

Whatever its shortcomings, this book is sure to stimulate interest in mathematical economics and in mathematics. If it encourages the student, who is mathematically ill-prepared, to pursue further studies in mathematics, it will have performed an exceedingly important function.

Marc Nerlove

<sup>1</sup> A good text is R. Bellman, *Stability Theory of Differential Equations*, McGraw-Hill, 1953.

THE SEARCH for eternal parameters that began with Pareto's universal formula for income distribution is carried forward impressively in this gargantuan production by Colin Clark. Perhaps best known popularly for his thesis that 25 percent of a nation's income devoted to taxes is a practicable maximum, Clark aspires to similar statistical verities arrived at by an encyclopedic compendium of national production, price, income, and other data for virtually all countries over a span of years that at times reaches back to the 19th century.

The proliferation of data allows the statistical analyses made to exceed in scope the wildest dreams of most day laborers in the field. For instance, a graphic regression of expenditure for farm products on real income uses data for 23 countries in two different time periods. Clark calls these "international and inter-temporal comparisons." Common units for his studies are an "International Unit" and an "Oriental Unit." The former, which was devised in 1937, is "... the quantity of goods exchangeable in the U.S.A. for \$1 over the average of the decade 1925-34." For various reasons, this unit is not satisfactory for comparisons that involve Oriental countries. The unit for them, the quantity of goods or services equivalent to one rupee in India in 1948-49, is further distinguished by being applied to productivity comparisons not per man-hour but "per head of the total population, per year." Such is Eastern timelessness!

From these analyses are obtained fundamental formulas such as those for food expenditure on real income—two in this instance, one derived from time series and one from international family budget data. (The latter is  $Y = \frac{81x}{X+124}$ ) Also obtained are limiting values: The maximum percentage of the working force engaged in agriculture, forestry and fishing in the most undeveloped economy is 75 percent; the highest percentage of national product that can ever go to labor is 90 percent. And so on.

By no means all the results are so statistically precise. But nearly all are equally empirical. The entreaty of yesteryear to go forth and study the real world was never so faithfully observed as by

Colin Clark. He is an empiricist of extreme complexion.

A collection of integers and coefficients does not constitute economic theory, and the weakness of this book is its preponderance of data to the near exclusion of theoretical generalization. From so expansive a study, at least a few induced conclusions should be forthcoming. They are almost absent. Instead, only disconnected running comments are offered. Many are superficial and unsatisfactory, such as the one that the share of national income going to labor tends to increase "... with time, and as the wage earner's opportunities of obtaining capital, education and experience increase..."

Virtual absence of systematic theory is all the more regrettable because the few threads that are present contain weighty thought. Among these are the implications of increasing returns, quoted from Clark's onetime tutor Allyn Young, which apparently were the stimulus to the book. A bugbear to Marshall, the enigma of increasing returns led to momentous advances in two directions, in the theory of imperfect competition (Sroffa, Jean Robinson, and many others), and in the theory of economic development. Students of development theory will do well to read Clark's excellent introduction to the second edition and the reference to Young that begins on page 343. Otherwise, conclusions from Clark's voluminous study are yet to be formulated. The title of the book itself is misleading. Instead of "Conditions" of economic progress, it should be "Chronicle" thereof.

But to admit disappointment in the lack of ready-made summing-up is not to disparage the value of the book as a source work. In both breadth and intricacy of detail it is astonishing. If you want to know the real income per person in Chile in 1941, the rate of increase in real product per man-hour per year in Portugal from 1914 to 1951, or the percentage of net income going to manufacture in Sweden in 1870, you will find them in Clark's book—they are 260 I. U., 0.8 percent, and 12.9 percent, respectively.

Without prejudice to Mr. Clark and equally with no intent of discouraging the use of his work for its wealth of data, reading it reminds one of Clifton Fadiman's classic quotation of a small

girl's review of a book packed with information on penguins: "This book tells me more about penguins than I am interested in knowing." Yet, notwithstanding the girl, whom Fadiman defended, and this overwhelmed reviewer, Clark's monu-

mental volume will serve for a long while as resource for the theory-making in the important area of economic development that he himself failed to achieve.

*Harold F. Breimyer*

*A Concept of Agribusiness.* By John H. Davis and Ray A. Goldberg. Graduate School of Business Administration, Harvard University. 136 pages. 1957. \$6.00.

SO CALLED FARM PROBLEMS presently confronting the food and fiber segment of the economy are agribusiness rather than agricultural in nature and scope and, therefore, such problems should be approached with agribusiness rather than agricultural perspective." This is the hypothesis that underlies the study—its *raison d'être*. The authors argue that the conventional entity "agriculture" is no longer appropriate for the purpose of assessing and improving policies related to food and fiber and that the broader concept is needed.

The term "agribusiness" denotes the sum total of all operations or economic activity involved in the manufacture and distribution of farm supplies. It includes production operations on the farm, and the storage, processing, and distribution of farm commodities and items made from them. One might term the concept one of an "integrated functional agriculture," encompassing all the inputs and outputs directly related to production and distribution of food and fiber.

A wide variety of data is used to illustrate the dimensions, magnitude, and flow of resources within the new entity and between it and the national economy. Some of the estimates are of limited reliability, and undoubtedly need further refinement, but all are useful in giving some idea of the relative scope of agribusiness. Yardsticks in terms of physical resources used, the size of the working force, and the value of output are developed to help the reader conceive of the major role of agribusiness in the total economy.

The authors' prime objectives in making the study are commendable. Certainly a better understanding of the existing relationships between the

on-farm and off-farm components of the entity is promoted by the statistical presentations. No doubt the new concept will help to suggest new approaches for improving policies relating to food and fiber. At any rate, with the new and broader frame of reference that the study suggests, hitherto overlooked implications of specific policies and programs will command the attention of analysts and policymakers.

Of particular interest to the reviewer is the chapter, "Agribusiness and the Future," in which the authors give a broad outline of an agribusiness approach to the solution of problems that confront the food and fiber sector of the economy. The authors assume the goals of agribusiness policy to be (1) economic stability geared to progress and to the optimum achievement of our national economic goals and (2) the shift of responsibility for such stability from Government to private sectors as rapidly as possible. To achieve these goals they stress the importance of integrated comprehensive research and the need for cooperation among the public administrators, farm organizations, commodity groups, business associations, and other spokesmen for agribusiness in formulating a comprehensive, well-defined, and well-balanced agribusiness policy. These, they maintain, "offer new hope of satisfactorily solving 'farm problems' in a manner consistent with American tradition and economic philosophy."

Researchers and technicians in the field of agriculture would do well to read this book, if only for the broader viewpoint it affords in definition and identification of this new entity of agribusiness.

*Robert H. Masucci*

*The Federal Lands: Their Use and Management.* By Marion Clawson and Burnell Held. The Johns Hopkins Press, Baltimore. 501 pages. 1957. \$8.50.

THE FEDERAL LANDS is the first book-sized product to be published by Resources for

the Future, a nonprofit corporation intended to advance development, conservation, and use of

natural resources, through research and education. The corporation was established in 1952 with the cooperation of the Ford Foundation, and its activities are financed by grants from that foundation. The book is a forward-looking piece that reflects the long experience of the senior author in western resource economics and his 5 years as Director of the Bureau of Land Management, plus the careful research that has gone into the study.

The authors examine briefly the question of whether the federal land will ever be disposed of and conclude that it will remain in federal ownership. This assumption is basic to their whole analysis. Assuming that our federal land is to stay in federal ownership, the authors review past history and trends in relation to future problems of management and suggest solutions for many of them. The history of federal lands and the place these lands occupy in the national economy today and may well occupy in the future are well summarized. The development of five major periods in the federal land-management policy of the Nation—acquisition, disposal, reservation, custodial management, and intensive management—give a useful background to their analysis.

A chapter that deals with uses of federal lands indicates the rapidly expanding overall use of these lands, the increased intensity of use, and the changing patterns of use in response to requirements. Another chapter discusses policy formation and decision making. It covers the role of pressure groups and the relation of local, State, and national interests in the formation of policies regarding federal lands and also the legislative and budgetary processes in relation to these lands.

The pricing processes and investments on federal lands are discussed in chapter 4. Here the authors stress the lack of competitive market forces in many phases of federal land management and the necessity of administrative decisions as one of the major problems. The mixture of competitive and administrative pricing for various uses of land complicates the whole federal land-management picture. The sharing of revenues with other federal programs and State and county govern-

ments may have an adverse effect on administration and development. For example, investment of federal funds in land improvement may bring a relatively small return to the federal treasury because of the sharing of any increased returns with these other units of government. This complicates the administrative decisions as well as the legislative decisions regarding investments on federal lands.

The authors' review and analysis of current problems are oriented to the future, and many of the trends are projected to 1980. Their analysis indicates that, since 1950, revenues from the use of public lands have exceeded expenditures. The total revenue from federal lands compares with the volume of business of some of the larger corporations. The need for intensive management of federal lands in the future brings up the question of how they should be managed.

Two plans are examined. One would provide for a federal land corporation that would take over the operation and management of all federal lands. The advantages and disadvantages of this device are thoroughly explored. An alternative would be to make changes in present management organizations, to achieve some of the advantages that might be had under a corporation form of management. The authors point out that one of the great needs of the future in federal land management is to join the best features of enlightened private business management with sound, tested features of public resource management. The latter must be extended to meet new demands imposed by the immensely greater uses made of the federal lands. The former are necessary in any conscious and explicit consideration of the financial aspects of federal land management today. The authors suggest that it is time to take a careful, critical, but imaginative, look at the problems of federal land management.

Agricultural economists will find in this book a new look at public land policies. They will find it well worth their time and enjoyably readable.

*Harry A. Steele*

*The Growth of a Science: A Half-Century of Rural Sociological Research in the United States.* By Edmund de S. Brunner. Harper and Brothers, New York. 171 pages. 1957. \$3.00.

**W**HEN A PIONEER and leading scholar in a discipline is inspired to chronicle and

evaluate its growth and progress, what he has to say must be heeded. This is especially true when

the discipline is young enough and the scholar old enough for them to have grown up together. Brunner confesses to being one of two young graduate students among 12 persons interested in rural sociology who gathered together for an informal meeting in 1912. From this meeting grew annual gatherings which eventually expanded into the Rural Sociological Society.

In the preface to his slender volume, Brunner outlines the problems faced in its completion: The considerable body of rural social research had to be reduced sufficiently for the publication resources available; studies had to be selected which portrayed fairly the research done at a given period on a given topic; and materials had to be organized under appropriate categories and presented in relation to the historical and topical organization decided upon.

Brunner isolates several influences or events in the pre-Purnell period which started rural sociology on its way. Among these were the appointment and reports of the Country Life Commission, 1908-09, the selection of "Rural Life" as the theme of the 1912 annual meeting of the American Sociological Society, the publication of three intensive studies of rural communities done under Giddings at Columbia University, and the work and personality of Charles J. Galpin, first of Wisconsin and later of the U. S. Department of Agriculture.

The first chapter is devoted to the pre-Purnell period of rural sociological research and the last is an appraisal of the methods and techniques, theory, contribution, and future of the discipline. These chapters are general in nature, and the remaining six are divided into major research topics wherein "representative" studies are discussed. In his topical discussions, Brunner traces the development and increasing sophistication of studies and classifies them according to type. He also reviews definitions and theory and summarizes major findings. This is a real service to the busy scholar.

It is logical that the author should begin with

an appraisal of community studies and follow with a review of population research, for these are the most popular research areas in rural sociology. A review of studies of the major social institutions precedes a discussion of research in rural social organization. Of special interest to agricultural economists is a chapter that treats sociological research on farm tenancy, farm labor, human factors in successful farming, part-time farming, mechanization, and cooperatives. A final topical theme is regionalism, suburbanism, trends, and values.

Brunner concludes that the total development of rural sociology is impressive and he summarizes the contribution of the discipline as follows: "It has brought an understanding of the rural community, its institutions, organizations, and groups. It has been responsible for improved demographic analysis of the characteristics of rural people. It has established the importance of human and social elements in gaining acceptance for agricultural improvements. Its analyses of culture, cliques, groups, and other collective phenomena have helped greatly in the effectiveness of action programs and in the improvement of established institutions. It has begun usefully to explore the opinions, attitudes, and values of rural people and to describe the communication processes among them. And among other contributions it has shared its knowledge and personnel for 30 years with countries in every continent."

In a work that is highly selective and has not addressed itself necessarily to the best studies in the field, one may look in vain for certain studies he considers classic. To this extent, some readers will be disappointed in Brunner's treatment. Some readers will feel also that certain topics have been overplayed at the expense of more deserving ones. But the inevitable general conclusion must be that this is a volume that has a rightful place on the bookshelf of every social scientist.

*Alvin L. Bertrand*

### **Selected Recent Research Publications in Agricultural Economics Issued by the United States Department of Agriculture and Cooperatively by the State Colleges**

ANDERSON, K. E. THE SPECIAL MILK PROGRAM. ITS EFFECT ON CONSUMPTION IN ST. LOUIS AND LOS ANGELES SCHOOLS. U. S. Dept. Agr. Mktg. Res. Rpt. 209, 45 pp. January 1958.

Marked increases took place in the average daily milk consumption per pupil in St. Louis and Los Angeles public schools serving milk after introduction of the Special Milk Program in 1955. This report analyzes the effect of this program on milk consumption in elementary and