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Book Reviews

Economics as a Science

By Kenneth E. Boulding. McGraw-Hill, New York. 157 pages. 1970. \$6.95 paperback.

The seven chapters of this book, though related, are written as independent essays. The first six chapters consider economics respectively as a social science, an ecological science, a behavioral science, a political science, a mathematical science, and a moral science. The final chapter considers economics and the future of man. The book is not intended as a textbook, but rather as a treatise to enrich economists' appreciation of the "larger scientific background" of their discipline. Boulding appears to consider this task to be even more important than the acquisition of specific analytical techniques.

There is little new in this book with respect to economics, *per se*, but there are some new interpretations of economics as it relates to the other disciplines mentioned. With respect to economics as a social science, the author suggests the major contributions of economics to the total study of society lie first in its concept of what might be called "the generalized price structure," that is, the total structure of all terms of trade—a structure which is of enormous importance in determining dynamics of performance in the total social system. The second important contribution is in the field of decision theory, where economics helps determine the performance reaction to perceived changes in the environment of the actor.

The chapter on ecology is particularly appropriate to today's interest in the economics and biological disciplines and Boulding uses the currently popular "ecosystem" as his working model. One interesting concept he utilizes pertains to the principal difference between biological populations and populations of commodities: He points out that, whereas the major limiting factor in the case of biological populations tends to be the death rate, in the case of commodities it tends to be the birth rate. Perhaps we are only now recognizing this phenomenon in an operational way. Boulding recognizes the population explosion and its implications and discusses the "spaceship earth" concept. This is the thesis that our ecosystem will soon require us to recycle all of the resources that we use if the environment is to remain in equilibrium and not destroy itself.

Boulding contends that the welfare of a society should be measured strictly by its state or condition and not by its throughput of production and consumption, for the gross national product increasingly includes such unproductive and mainly "maintenance" items as national defense, commuting to work, the replacement of unnecessarily shoddy commodities, etc. It is Boulding's contention that the ideological conflict between socialism and capitalism is no longer a controversy between advocates of planning and those of laissez-faire, rather it is a controversy over the best methods of deciding what future the society wants and how it proceeds to obtain it.

In discussing economics as a behavioral science, Boulding discounts the usefulness of traditional marginal analysis for decision making, primarily because data on which decisions would have to be based are often unavailable. He attributes more merit to cost-benefit analysis and program budgeting. At several junctures he makes the strong point that there is a common tendency among economists to mistake abstractions for reality and to assume decision making can be based entirely on these abstractions. Introduction of politics into decision-making makes the "Pareto better off" concept largely irrelevant to many important problems. This is particularly true of those problems dealing with public goods as compared with private goods.

Mathematical science according to Boulding has made a very substantial contribution, but he reminds us that mathematics in any of its applied fields is a wonderful servant but a very bad master. In social systems, and in economic systems in particular, a real shortcoming of econometric analysis has been that of unexpected changes in the parameters, the basic constants of the equations.

In discussing economics as a moral science, Boulding points out that the scientific subculture is itself characterized by a strong common value system. High values are placed on veracity, curiosity, measurement, quantification, observation, experiment, and objectivity. Moreover, as science develops, it no longer merely investigates the world but creates the world which it investigates. Boulding lists three areas in which economics has made a contribution to general ethical theory. The first is a generalization of the theory of exchange value in the direction of ethical and social choice. The second is the field of welfare economics, and the third, the impact of

economic measurement and indices upon normative judgments, especially in political life.

Boulding cites major contributions of economics to man in two fields. One is that of macroeconomics and employment policy, which has eliminated the extreme fluctuations exemplified by the depression of the 1930's. The second contribution is proficiency in the area of decision making which has been enhanced by programming and related economic analyses. The major failures of economics are cited as inability to develop an adequate theory of economic development to serve as a basis for policy recommendations for the poor countries, failure in the field of urban poverty, and deterioration in the whole matter of providing improvements in the physical environment. Boulding's reasons for these successes and failures are themselves very interesting.

In conclusion, Boulding points out that recently trained economists have not been exposed to the "great empiricists and institutionalists of the past." Granting the value of econometrics, he regrets that the quick return to economics in the last 30 years has been through bright young mathematically inclined economists who have devoted themselves to the analysis of existing data rather than to the collection of new data at the source. He also adds a critical comment or two relative to the contribution of graduate schools in fostering this situation.

This set of essays, like most of Boulding's writings, is extremely interesting and thought provoking. Few people will agree with everything he says, but I would expect that few people would read the book without indulging in some good intellectual stocktaking of where the economics profession is and where it should be heading. As usual, Boulding includes some good humor and criticism. He does a convincing job of questioning the legitimacy and relevancy of moving in a one-to-one relation from a value theory based on utilitarianism to a market-based economics.

W. B. Sundquist

Economic Analysis and Operations Research: Optimization Techniques in Quantitative Economic Models

By Jati Sengupta and Karl Fox. North-Holland Publishing Company, Amsterdam and London, and American Elsevier Publishing Company, New York. 478 pages. 1969. \$20.10.

Economists tend to weave a unified theory around problems. This gives a sense of interconnectedness among problems; a unity of approach among researchers; and a source of testable hypotheses with which to initiate research. Operations researchers are more Bacon-

ian in their philosophical approach: They pragmatically seek to induce empirical answers to immediate problems. Sengupta and Fox have presented us with a publication whose title, "Economic Analysis and Operations Research," suggests a merging of the two disciplines. But the fundamental difference in methodological approach is wide enough to preclude merger. The organization and content of the book does not benefit so much from the authors' understanding of economics as from their understanding of operations research techniques. Consequently, the reader can learn a lot about techniques but not much about economics. The intersection of the two disciplines displays a common interest in the types of problems tackled and in the mathematical and statistical techniques used. The authors' awareness of this is acknowledged by their subtitle: "Optimization Techniques in Quantitative Economic Models." This subtitle is descriptive of the book's content: A selected collection of mathematical and statistical techniques of interest to workers in both disciplines.

Half the book is devoted to programming techniques. The unique strength of this section lies with the authors' ability to buzz through dozens of variations in the activity analysis problem, devoting to each a page or two for a precise mathematical statement of the variant problem and a page or two on computational aspects. Occasionally a page or two is allocated to an application. This section opens with a 12-page statement of the conventional linear programming problem which is tightly written and covers as much ground as is often covered in an entire book. Its function here is mostly for review and for establishing notation. Prospective readers are advised to know what is in these 12 pages as a prerequisite to picking up the book in the first place. The next 200 or so pages give fascinating peeks into all sorts of variations on the programming problem including fractional, integer, decomposition, recursive, quadratic, variational, control, dynamic, parametric, sensitivity, probabilistic, risk, and other programming.

The rest of the book is independent of the programming section. It treats of calculus, matrix algebra, and probability techniques used in the theory of the firm and microeconomic equilibrium, macroeconomic topics, and regional analysis. As with the programming section, the authors do not duplicate the ordinary textbook treatment of these topics. Rather, they assume that as a prerequisite and proceed to wander through many variations of the usual problem formulation. They look into problem formulations of inventory control, investment in plant and equipment, intertemporal firm and industry equilibrium in perfect and imperfect competition, growth, location of firms and of economic activity, decentralization, optimization for a nonmarket institu-

tion, and nonmarket aspects of complex social systems.

Your reviewer enjoyed reading this book, and he learned something about optimization techniques in the process. Now he is anxious to recommend the book. The problem is: To whom? It is hard to recommend to students because the prerequisites are demanding and the topical coverage is selective. It is hard to recommend as an encyclopedic reference volume because the many formulations are scattered, with poor indexing and cross referencing and with few guiding subtitles. It is hard to recommend to browsers because it is tightly written and the notation flows with subtle changes from one problem to the next, making it difficult to find an intermediate starting point from which to browse. However, many readers go through books such as this one seeking inspiration to formulate variations of their own in order to tackle immediate problems of their own requiring application of advanced optimization techniques in quantitative economic models. If you are one of those readers, I recommend this book to you as a source of insights into variations of conventional textbook treatments.

Clark Edwards

Techniques for Project Appraisal Under Uncertainty

By Shlomo Reutlinger. The Johns Hopkins Press, Baltimore. 95 pages. 1970. \$3.

The problem of formulating an optimal investment plan composed of investment projects whose outcomes depend on "risky" or "uncertain" parameters and variables is a form of decision under risk and uncertainty. Several theories have been developed which assume differing forms of "rational behavior" under risk and uncertainty on the part of decision makers. These theories suggest methods of solving the decision problem consistent with the behavior assumed. Although real-world decision makers may behave in manners assumed by any one of the theories, in practice they do not employ the methods suggested because (1) they are not aware of them and (2) they lack the specialized knowledge to understand and employ them. Reutlinger's monograph is an attempt to acquaint the real-world decision maker with the subjective probability approach to decisions under uncertainty, and to render the methods suggested by this approach into usable tools.

The appraisal of an investment plan begins with the evaluation of the individual project proposals. Reutlinger devotes a considerable amount of time to the questions of what information these evaluations should include,

how they should be derived, and how they should account for variables whose values are uncertain. Basically his conclusions are these:

(1) Evaluation of an investment project should be based on an estimate of the distribution of net benefits. The mean and variance of the estimate are indicators of outcome and risk. The computation of the expected value, or any single value estimate of net benefits alone, does not give any indication of the risk involved. The computation of limits alone, between which the actual net benefit will almost surely lie, does not indicate the most likely value. Frequently the limits are so broad as to include many unfavorable returns and to render the estimates of aggregate net benefits to an investment plan too broad.

(2) Since an estimate of the distribution of net benefits is required, an evaluation is best derived by estimating the joint probability distribution of all variables and parameters. The corresponding distribution of net returns is then derived with the aid of a mathematical model of the project.

(3) When the distribution of probable values for a variable or parameter is unknown, subjective estimates should be substituted since this action is consistent with observed behavior. Reutlinger proposes several methods for deriving a "subjective" probability distribution of a variable or parameter whose outcome is uncertain.

The bulk of the monograph is devoted to considering two feasible methods of deriving the estimated probability distribution of net benefits. There are now available computer programs which, given the model and the distributions of the variables and parameters, construct estimates of the distribution of returns. The use of the computer is certainly desirable if the model is complex. If the model is simple or a computer is not available, Reutlinger suggests the use of probability calculus to derive the mean and variance of returns as a proxy to the entire distribution. Although this latter technique harbors hazards which a computer can easily be programmed to avoid, Reutlinger is thorough in his analysis.

Finally, Reutlinger turns to the problem of deciding upon the composition of an investment plan or between alternative plans. In theory, the decision is a matter of maximizing the utility of aggregate returns for the individual. For the decision maker in the public sector it's a matter of maximizing a social welfare function. Unfortunately, in practice it is usually impossible to quantify either a utility or social welfare function and therefore the individual must base his decision primarily on experience and intuition. There is one other guide to project portfolio selection, which is to seek out "compensating risks." If a high percentage of the outcomes of

projects included in a plan are correlated, failure of any project will usually imply failure of all projects. In other words, you are dealing with an "all or nothing" situation. If the outcomes of projects are uncorrelated, the failure of one project will usually be compensated by the success of another. Therefore, to the degree that the decision maker can assure himself that the outcomes of projects within his plan are uncorrelated, he can have confidence in achieving the aggregate expected value.

These are in brief the major points of the monograph. Many other topical points are touched upon, including questions of the value of additional information, timing, model structure, and the nature of decision problems for public officials. A weakness of the monograph is its tendency to shift focal points suddenly. The monograph is aimed at the level of those familiar with the problems of investment decision, however, and therefore such shifts should not prove too unsettling to the reader.

The reviewer (and Reutlinger in his monograph) intends to steer clear of questions of conflicting methodology implied by the several theories of rational behavior in the decision process under uncertainty. However, readers should be aware that there are other solutions to the problem, including game and Bayesian strategies. One should not embrace Reutlinger's approach unless it is consistent with his own behavior.

John Howell

The Fiscal Revolution in America

By Herbert Stein. The University of Chicago Press, Chicago and London. 526 pages. 1969. \$10.

Stein has given us an outstanding book that is informative, entertaining, and extremely current. If, for example, you are worried about the deficit in the Federal Budget probably forthcoming this quarter, a couple of nights with *Fiscal Revolution* will do you a lot of good. Not only will you view the debt in proper perspective to other national aggregates, but you will also gain an insight into the impact of an unbalanced budget upon the President, and what a Chief Executive is likely to do or not do when red ink appears. You get all of this in readable detail.

Writing before his present appointment to the Council of Economic Advisers, the author candidly traces the slow, awkward acceptance by both political parties of the principle of managing Government expenditures and taxes to help insure economic growth and price stability. The Keynesian contention that a planned budget surplus or deficit will have multiple

effects upon private investment and consumption has been acknowledged almost universally by the economic community. A defense contractor in a depressed area receives funds from the Air Force; pays his subcontractors, employees, and stockholders. These recipients, in turn, buy (after saving a certain portion) supplies, food, automobiles, clothes, and so forth. At each stage of transfer, someone's expenditure becomes another's income until at last the exchange becomes minute and the ripples caused by the big expenditure fade. Ideally, everyone gains because they have worked using their skills and facilities, expanding and creating productivity and capacity.

Although the Congress and the Administration during the past 40 years may have logically accepted the multiplier and the accelerator, in their hearts they knew there was something un-American about the whole idea. In looking at the national budget, it is extremely difficult to divorce one's personal experience that the family budget should not exceed immediate income for any sustained period. Even Franklin Roosevelt, breaking with all precedents in seeking to rescue the 12 million unemployed of the depression, failed to a great extent because he constantly sought to return to fiscal "respectability." Not until World War II did the Nation spend enough to achieve his goal.

Because of his long association with the Committee for Economic Development, Stein is at his best in explaining the role of business in fiscal policy. Businessmen's confidence is essential in any attempt to curb inflation or to stimulate investment over the long run. The tax reduction promised by President Kennedy in 1962 and signed into law by President Johnson in 1964, commonly viewed as the final defeat of budget balancing, was actually a sort of marriage between conservatives and those who felt government has a responsibility to promote economic growth for the general welfare. It marked a situation in which industrial statesmen recognized the advantages of stimulating the economy by releasing funds to the private sector. The tax cut has the ability to increase purchasing power immediately, while expenditures must be carefully processed to achieve the best effect. But best of all, the tax cut is something that industry and the financial world can utilize.

Unfortunately our book leaves us at the peak of fiscal success, 1964, when all economic indicators are pointing upward and price acceleration has yet to make its dramatic appearance. Economists are glowing and "fine-tuning" is in vogue. But beginning in 1965, materials, manpower, and money have become scarce and increasingly expensive as costs soar. After several critical years, the President and the Congress finally agreed in 1968 to a cut in proposed expenditures and a 10 percent surtax,

illustrating the administrative and political difficulties that makers of fiscal and monetary policy face.

In 1970 we are faced with a double task: (1) Curb the inflation caused by our overexpansion and rigid cost structure and (2) increase the productivity of our workers and facilities. Can monetary and fiscal measures accomplish this minor miracle without severe unemployment? This is the book we'll want to read. It will be very interesting to see how Stein describes his own years of Council duty. If he does as well as he has in *Fiscal Revolution*, the book should be a best seller.

Meyer J. Harron

Change in Agriculture: The Northern United States, 1820-1870

By Clarence H. Danhof. Harvard University Press, Cambridge. 322 pages. 1969. \$10.

The five decades from 1820 to 1870 brought tremendous changes to agriculture in the Northern States. This was the period during which the United States emerged from an agricultural economy to an industrial economy. And within agriculture the transition was made from subsistence to commercial farming.

Clarence Danhof, an economist, has used a different approach in his treatment of this important period. His is essentially an interpretative study rather than a chronology of change. He focuses on problems, functions, ideas, and successful solutions rather than on individual farmers or personalities. Thus his chapters deal with the changing environment, the growth of marketing institutions, sharing and expanding the fund of knowledge, prerequisites for farming, acquiring title to a farm, management of the farm enterprise, reaction to improved implements, and utilization of the soil.

Productivity of modern American agriculture has its roots in changes in motivation, technology, and institutional organization that have had cumulative effects beginning in the early part of the last century. Basic to the whole gamut of change from subsistence to commercial agriculture was an acceptance of agriculture as "market-focused, profit motivated," characterized by a "rational approach to technology." Such a process was sporadic, influenced by expanding knowledge of methods, improved implements, and livestock.

Acceptance of change was slow, conditioned to some extent by physical factors. However, events outside of agriculture, such as transportation improvements, growing urban population, and expansion of external markets, had their impact. "Big farming" became a question

of net income rather than number of acres cultivated. Conversely, industrial developments were fostered by the growth of commercial agriculture, and in turn contributed to agricultural improvements.

By the beginning of the Civil War, agriculture as well as industry, in the Northern States, had progressed to the point where it was able to meet the challenges and increased demands of this crisis. The war years also saw the passage of four laws that were to have ever-increasing impact on agriculture in the years ahead--the Land-Grant College Act, fostering agricultural colleges; the Pacific Railway Act; the Homestead Act; and the Act establishing the Department of Agriculture.

As the Nation readjusted to production for its peacetime market, criticism of marketing facilities continued. There is little information in this study on the postwar period. Of lesser importance to the general story are a few factual deficiencies that probably only a specialist would find. For example, many of the early Hussey reapers were custom made in barns of plantation owners; and the Advisory Board on Agriculture of 1859 had little direct impact, aside from its representation of developing ideas.

The study is well documented, with many explanatory footnotes that add much to the narrative. The extensive bibliography reflects careful research and provides a stepping stone for those seeking further information.

Anyone interested in the factors underlying developments in American agriculture will find *Change in Agriculture: The Northern United States, 1820-1870*, of value. Danhof has provided a case study for historians, economists, and specialists in the economic problems of developing countries, from which they can profit.

Vivian Wiser

Soviet Agriculture in Perspective--A Study of Its Successes and Failures

By Erich Strauss. Frederick A. Praeger, Inc., New York, Washington. 328 pages. 1969. \$8.50.

Die Landwirtschaftlichen Betriebsgrößen in der Sowjetunion in Statistik und Theorie (The Optimum Size of Farms in the Soviet Union in Statistics and Theory)

By Ivan Loncarevic. Osteuropastudien der Hochschulen des Landes Hessen, Reihe I, Band 45, Otto Harrassowitz, Wiesbaden (West Germany). 184 pages plus maps. 1969. (No price.)

Les Marchés Paysans en U.R.S.S. (The Peasant Markets in the USSR)

By Basile H. Kerblay. Mouton & Co., Paris. 517 pages. 1968. (No price.)

Despite the great outpouring of scholarship on Soviet agriculture in the past few decades there are few good, and no current, general surveys of the subject. Naum Jasny published his monumental *The Socialist Agriculture of the USSR* (Stanford) in 1949, and Lazar Volin published his *A Survey of Soviet Russian Agriculture* (USDA) in 1951. These two works, based largely on materials available before the Second World War, were landmarks which are still used extensively.

Since Jasny and Volin published their books major changes have taken place in Soviet agriculture, and since 1958 there has been a great outpouring of statistical and other published material. These developments have produced a wealth of journal articles and compendia, but no general surveys.

This void Strauss has filled with a smooth and comprehensive overview of Soviet agriculture from 1917 to the present. Specialists will find little in Strauss' book which is new, and they might find some points to argue with. But the general reader will be grateful for this readable and comprehensive survey. Strauss' exposition is generally well balanced and noncontroversial.

The book is divided into three parts. The first part, "Starting Points," sets forth some of Strauss' general observations on Soviet agriculture. Of these the most important are the following:

1. The recognition, which most objective students must now accept, that "compulsory collectivization" was "a major social and economic catastrophe" (p. 22). This has not been recognized in official Soviet dogma, but much of Soviet agricultural policy since 1932 has been an attempt to overcome the impact of this ill-conceived and ill-executed policy.

2. The terrible burden placed on Soviet agriculture by the USSR's policy of forced industrialization in an extreme isolationist context (p. 26). This industrialization in a predominantly agricultural economy presupposed increases in agricultural productivity; but compulsory collectivization, with the object of extracting a "surplus" from agriculture, produced exactly the opposite effect. This situation does much to explain the special significance of agriculture in the Soviet economy.

3. Bureaucratic dictatorship, as Strauss notes, produced the tendency toward "sweeping campaigns" (p. 39), which has typified Soviet agricultural policy. Because no one dares to be out of phase with existing dogma, policies have usually been pushed to unrealistic extremes to the detriment of agricultural progress.

The second part, "The Past," is a chronological history of Soviet agriculture from 1917 to the present.

There is little new or argumentative in these chapters, which deal successively with the period of "War Communism and the NEP" (1917-28); the period of collectivization and its aftermath (1925-40); the period of "War, Recovery, and Stalemate" (1941-53); the "Khrushchev Era" (1953-64); and "after Khrushchev."

The reader unfamiliar with these events will find a good general review of the aftermath of the First World War and the Revolution, the period of the New Economic Policy (NEP), and the factors which led to the decision to collectivize—the desire to gather from agriculture everything above subsistence at no price or a nominal price, and to gain complete control over the peasant economy. The aftermath of this policy—the drop in total grain production but a rise in grain available to the government, and the heavy slaughter of livestock—is described. The slow recovery to 1940 and the heavy losses during the war are also covered.

With agricultural output at the time of Stalin's death in 1953 still below the level of 1913, Strauss states Khrushchev's dilemma well, and describes his efforts to gain quick results from agriculture to feed a rapidly growing industrial economy. He gives Khrushchev his due for transforming Soviet agriculture from a harshly exploitive, nonmonetary system to one which is largely monetized and partly rejuvenated by capital investments and increased incentives.

He also outlines the crucial elements of the new agricultural policies of Brezhnev and Kosygin which helped to produce the rapid recovery of Soviet agriculture during 1966-68.

In the last part of the book, "Problems and Prospects," Strauss deals with four important issues: (1) How much agricultural produce does the Soviet Union need? (2) How much agricultural investment does the Soviet Union need? (3) How high are Soviet prices and costs? and (4) Are Soviet farms too large? These are rightly seen by Strauss to be the most critical questions one should ask about Soviet agriculture today, but I feel this is where the book is weakest, and where specialists would tend to argue the most with Strauss' conclusions.

Strauss says (p. 245-50) that although the diet is low in quality it is adequate, which is true. I think, however, that he understates the need for improvement. It is often hard to comprehend the magnitude of changes necessary to make significant improvements in the Soviet diet. The average Soviet citizen will not draw much satisfaction from the output projections by FAO and others which Strauss cites, nor the production plans announced by the USSR for 1971-75.

The need for additional investment in Soviet agriculture is stressed by Strauss. I agree very strongly on this point, but many students of the subject would not.

Although Strauss' treatment of the relative cost of agricultural production is not extensive his major points, if I understand them correctly, are valid.

By comparison with the United States, Soviet agricultural costs are high, but this distortion is diminished by other international comparisons. Strauss correctly notes the very low labor productivity of Soviet agriculture, due largely to the heavy dependence on labor in a country with great seasonal fluctuations, and where a large part of the labor force consists of old people, women, and children not yet able to escape to the cities. The absence of adequate capital, low incentives, and no real room for the play of market forces all contributed to this situation.

Although the problem of optimal farm size in the Soviet Union is a difficult one, Strauss seems unnecessarily vague about this issue. He is undoubtedly correct in attributing the gigantic Soviet state farms and collective farms to shortages of management and technical talent, rather than any serious economic consideration.

He also has a good point in suggesting that the American family farm in the economic, political, and social context in which it has grown up and operates is not a good yardstick for measuring the optimal size of farms in the USSR.

But this does not clarify the question posed by the authors—are Soviet farms too large. They clearly are, as most specialists would agree and as the Soviet leadership seems to imply by the substantial decline in average farm size since 1966.

On the subject of the optimal size of farms in the USSR, the specialist who reads German will find the book by Loncarevic interesting. It is a detailed geographic and statistical study of the structure of farms in the USSR. It has the disadvantage of being primarily concerned with Soviet methods of determining the optimal size of farm rather than developing an analysis of the subject itself. For the specialist on Soviet agriculture, however, the book is useful.

Both the specialist on the USSR and the interested reader, if he reads French, will find Kerblay's *Peasant Markets in the USSR* invaluable and interesting. This book is obviously the product of extensive and careful research on a subject of great significance to Soviet economic life. Despite its significance, however, it has received little attention.

The peasant markets were of great importance in Russia and Kerblay provides some of this history. Despite heavy pressures after 1917, the peasant markets survived and to a very great extent provided the safety valve which made it possible for the clumsy Soviet planned economy to survive.

Kerblay describes in detail the kinds of peasant markets and their geographical location. He describes and analyzes the historical development of peasant markets in Russia and in the Soviet Union from the 19th century through the early 1960's. He devotes considerable time to the collective farm markets in the USSR which have been, and still are, a major source of quality fruits, vegetables, and livestock products to the rural and urban Soviet consumer; and a major source of income to Russian farm workers whose incomes from their work on state and collective farms have seldom been adequate.

With the advancement of Soviet economic and industrial growth, state retail stores have grown greatly in the distribution of goods to consumers. This has diminished the relative role of peasant markets, but they are still significant. The large increase in farm incomes which has resulted from the higher prices and increased farm sales to the government in the past decade and a half have diminished the relative significance of the peasant (collective farm) markets as a source of farm income. This source is still quite significant, however, and the collective farm markets still account for a large share of the retail sales of livestock products, fruits, vegetables, and potatoes.

Harry E. Walters

The Agricultural Development of Venezuela

By Louis E. Heaton. Frederick A. Praeger, Inc., New York. 350 pages. 1969. \$15.

In common with women's dress lengths, this book was obsolescent before it was published. According to the foreword, the study was made during 1966 and 1967, but the publication date is 1969. Using data no later than 1965 for analysis purposes compounds this difficulty.

The 5-year period 1961-65 shows Venezuelan agricultural production growing at a rate of only 4.4 percent because 1961, which saw a 6 percent fall, is included. Agricultural production for the 10-year period 1960-69 rose at a rate of 5.6 percent. Thus the constraints of the time period provide the author with an analytical base that forces relatively pessimistic conclusions.

Heaton was an important contributor as a technical adviser in the preparation of *Long Term Forecasts of the Supply and Demand of Agricultural and Livestock Products in Venezuela*, prepared under contract with the Economic Research Service, and issued in 1965. He draws heavily upon that study for certain projections, as, for example, the total income of the Venezuelan

petroleum industry in relation to the total fiscal income of the Venezuelan Government. The study is, however, not mentioned in the volume.

The author provides a series of interesting and useful tables on agricultural progress. Table 82 detailing changes in crop production methods is a good case in point. The tables are properly labeled as subjective evaluations, but they are very useful and on the whole, stand up well to a 5-year test.

While the middle sections of the book are flawed, more often than not by the 1965 cut-off date which antedates, for example, the rapid increase in sugar exports, the final sections continue to be valid. The author has a sound understanding of factors impeding agricultural growth in Venezuela, and by extension most Andean countries.

The last chapter is the best in the book. Here the author brings out basic problems and provides his ideas as to their solution. He shows that the lack of cadastral survey work, labor skills, and a civil service law have cost Venezuela severely in agricultural development.

Some of his solutions, such as land tenure changes based on commercial-size farms, are not currently popular, but he makes good arguments in favor of his position.

The Agricultural Development of Venezuela is not a "benchmark" work on Venezuelan agriculture. Nonetheless, it provides a good picture of Venezuelan agriculture from 1961 to 1965, and seen in that light is a satisfactory piece of work.

John McAlpine

Tropical Agriculture: The Development of Production

By Gordon Wrigley. Frederick A. Praeger, Inc., New York, 363 pages. 1969. \$13.50.

This latest edition of a general book on tropical agriculture is a most useful and effective guide to the development of tropical crops, livestock, and pastures, as well as subsistence crops. It has something of value for all who work in or are interested in tropical agriculture, whether in Africa or America, or in such crops as coffee, sugar, cacao, tea, corn, and rice. This book is the most

effective and understandable one the reviewer has known in more than a quarter of a century of tropical experience and background. There is now need for an equally effective book from the social science viewpoint to further narrow the gap between the natural scientist and social scientist interested in increasing productivity in the tropics.

This book clearly presents for the nonspecialist the technical background on tropical crops and livestock, including some unique and useful charts and tables on subsistence crops and livestock management and pastures in the tropics. These tables, the livestock section, and the brief but comprehensive bibliography are alone worth the price of the book. The author strongly suggests also that local research studies be consulted on specific crops and problems.

A brief listing of the general contents indicates the practical use of the present book: Crop ecology—soils, tropical rainfall, solar radiation, cover crops; crop culture—agricultural systems, crop rotation, cultivation, planting, soil and water conservation, fertilizer, irrigation, harvesting, and processing; crop improvement, including up-to-date analyses of problems and recent achievements; crop protection; and lastly, the place of cattle in tropical agriculture, the tsetse fly, pastures, and legumes. There is a useful glossary of soil terms for the nonspecialist. There are few gaps in the bibliography. It includes references to such United States authorities as Charles E. Kellogg, E. F. Knipling, W. O. Jones, Frederick L. Wellman, A. O. Rhoad, George Sprague, and Bruce F. Johnston. It also refers to the summary publication on coffee around the world by C. A. Krug, the eminent Brazilian coffee specialist.

It is hoped that revised editions may include additional material on Brazil, crop diversification, and improvements in the American tropics, and more on crop improvement work by the staffs of the Rockefeller Foundation and local governments cooperating in Latin America, Africa, and Asia. If a revised edition is issued, it should also include references to recent accomplishments in corn improvement work in Kenya, to corn as an export crop in Thailand, and to the progress being made in improving millet and grain sorghum production in India and Africa.

Robert C. Moncure

Sorghum

By H. Doggett. Humanities Press, Inc., New York. 403 pages.
1970. \$20.

The latest addition to the "Tropical Agriculture

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