Book Reviews

A Survey of Marketing Research: Organization, Functions, Budget, Compensation. American Marketing Association, Chicago. Loose leaf, 103 pages. 1959. $10.00.

THIS BOOKLET presents the results of a mail survey regarding the place of marketing research in American business in the United States and Canada. Questionnaires were sent in April 1957 to the 2,892 firms represented by members of the American Marketing Association and to 575 additional firms belonging to other national associations. With two followup requests, the total response was 39 percent. A description of some of the results follows.

Marketing research departments are more common in large firms than in small ones. Of the largest firms, for example, those with annual sales of more than $500 million, 93 percent had formal departments. In addition, 5 percent of these large companies had one person assigned to marketing research. On the other end of the scale were firms with annual sales of less than $5 million; 30 percent of these had formal departments, 28 percent one person assigned, and 42 percent no one assigned. It is pointed out, however, that companies without specific assignments may have sales managers, advertising managers, or others not explicitly engaged in research who participate in marketing research to some extent.

All told, some 60 percent of the companies reporting (excluding market research and consulting firms) had formal market research departments. The incidence was highest in advertising agencies and in publishing and broadcasting firms (72 percent) and lowest in retailing and wholesaling companies (46 percent). Companies having no one assigned to research included a disproportionate share of retailers and wholesalers (36 percent).

The titles of the charts and tables included in the booklet pretty well tell the story:

"Advertising, publishing, and broadcasting firms are highly organized for marketing research even in smaller firms" (chart 4).

"Agencies and media have the largest formal marketing research departments" (5).

"Number of new departments formed in successive 5 year periods" (6). This title is not fully informative, but the chart shows a rapid growth beginning with the period "before 1918." Almost six times as many marketing research departments were organized (273) between 1953 and 1957 as the number existing 20 years before.

"Media and advertising agencies formed research departments earlier" (7).

"Marketing research managers most commonly report to sales or marketing executives" (table 2).

Following is a section on marketing research budgets. In 1957, manufacturers spent more than 70 percent of the total spent for marketing research, with consumer goods offering a more prominent position than industrial goods. Advertising agencies, together with publishers and broadcasters, spent about 20 percent of the total; while retailers and wholesalers spent only 2 percent. "Marketing research budgets are a fraction of 1 percent of sales for manufacturers and decline in percent as size (of business) increases (chart 10), agency and media budgets are larger . . . (11 and 12), manufacturers of consumer goods spend more of their budgets for outside research (table 3)."

Other topics covered by charts, tables, and brief narrative accounts are The Subject Matter of Research, and The Compensation of Marketing Research Personnel. An appendix contains a few additional tables, together with reproductions of the letter and questionnaire mailed.

The many subjects of research reported include development of market potentials, share of market studies, determination of market characteristics, sales analysis, studies of market changes, establishment of sales quotas and of sales territories, store audits in test markets, studies of channels of distribution and of distribution costs, studies of "deals" and premiums, methods of paying salesmen, personnel requirements, export markets, potentials of new products, competitors'

products, product testing and packaging research including design or physical characteristics, short-range forecasting, long-range forecasting, business trends, profit analysis, plant and warehouse locations, use of projective techniques and "motivation" research, copy research, and media.

The mean compensation of directors of marketing research increases with the number of years of marketing research experience, and with the size of the company and the size of the department. The best paid directors are in advertising agencies and among publishers and broadcasters; the poorest paid are in retailing and wholesaling. Statisticians rank higher in salary than analysts but below senior analysts. Women receive less pay than men at all levels of activity.

From appendix tables, it may be noted that the modal group for marketing research directors in manufacturing companies falls in the 5- to 9-year category in terms of marketing research experience; but in marketing research and consulting firms and in advertising agencies, it is in the 15-year-plus category.

Robert M. Walsh

Planning of Experiments. By D. R. Cox. John Wiley and Sons, Inc., New York. 308 pages. 1958. $7.50.

IN DESIGNING an experiment with a small total number of experimental units, an arrangement may be obtained as a result of the randomization, which is unsatisfactory. For example, the random arrangement may fit in with a potentially meaningful pattern in the experimental material. A discussion of ways of dealing with this situation is one of several special features of this elementary but careful presentation of the statistical aspects of experimental design.

General concepts and the classic designs of randomized blocks and Latin squares are described in chapters 1 to 9. Later chapters introduce more advanced subjects, such as incomplete blocks and fractional replications. In addition to randomization, other topics of interest include a discussion of the different purposes for which observations may be made, and the relation of covariance to randomized blocks and to the calculation of adjustments. Considerable attention is given to basic ideas about factorials with specific discussion of different kinds of factors that can occur in this type of experimentation.

Writing for nonstatisticians, the author has attempted to present a basis for experimental design that is intuitively acceptable. Detailed methods of statistical analysis receive only incidental attention. A few sections of the book are argued rather closely and are not easy reading, but for the most part no specialized knowledge is required to understand it. Carefully chosen examples from several fields of application are used throughout the text to illustrate specific points under discussion. The examples are usually set off from the main text, thus enabling the reader to consider them or not as he wishes.

Although supplementary references on statistical analysis would usually be required in actual experimental work, *Planning of Experiments* is well written, and can be recommended as an excellent reference work for persons interested in a simple but fundamental presentation of the statistical aspects of experimental design, either as a background for possible use of this tool, or as an aid in the evaluation of work in which formal design has been used.

Therese Kelleher

Econometric Analysis for Public Policy. By Karl A. Fox. Iowa State College Press. 1958. 288 pages. $4.50.

TWO GROUPS of economists, the mathematically inclined and those interested in public policy, are likely to be attracted by the title of Professor Fox's book. Only the former group is likely to see it through, however, as it is immediately apparent that a good deal more effort is spent on the intricacies of econometric analysis than on public policy applications.

But the author does not neglect public policy applications—he states a hopeful credo in the preface to help sustain those econometricians who despair at the gulf between their models and the public policy decisions that might have been, but apparently were not, influenced by them. Speaking of economic analysis for policymakers, Fox states that "As time goes on, such studies tend to enrich the thinking of administrators, legislators, and leaders of public opinion. . . ." I believe he is right in this, and has himself made important contributions to the progress made so far.

The book is in two parts, the first entitled "The Analysis of Demand." Here the author is concerned with demand estimates, some of which are used in models of the economy presented later. The extensive review of the literature in chapter 1 will be welcomed by students of demand analysis, as will the chapters on commodity demands and demand structure that make up the rest of part I. But as most of the work in this part has appeared before and has merited Fox's well-deserved credit, it is fair to say that the contribution of the present volume is largely to bring the work between two covers and hence more readily available. I do not believe that anything new is added on the question of the "rightness" of simultaneous- or single-equation methods in demand analysis situations.

In part II, Fox uses demand estimates derived in part I, and other coefficients, to implement both simple and complex economic models. Many of the examples are somewhat dated, suggesting that the author intends this section more as a manual on procedure than as a guide to current policy. Chapters 8 and 11 are well suited to such a purpose; they provide simple techniques for analysis of specific short-run problems. Chapters 9 and 10 present Fox's pioneering work in spatial equilibrium analysis of the livestock-feed economy, and chapter 11 is a critique of the Klein-Goldberger model of the U.S. economy. All have appeared earlier in essentially the same form.

If there is a central idea in part II, it is that econometric models as inclusive as data allow are useful in preparing for public policy decisions. A last-page endorsement of continued work on such models, using various statistical formulations and synthetic models as well, is not unexpected.

I wish that Dr. Fox had said more about the task of making such analyses felt in public policy. Clearly, the lines of communication between economists producing simultaneous equation models of the U.S. economy, and the policymakers, are long and poorly connected. I am not sure that there are many econometricians who are making themselves heard and understood by policymakers. Rather, their work becomes useful to intermediaries who ultimately communicate with men at the policy level.

Not all will agree with the author's statement following page 288 that "The economist can be most valuable to the policymaker if he maintains his competence and perspective by carrying on a research program in the areas in which his advice is sought; if he sits constantly at the policymaker's right hand, he is likely to become an administrative assistant rather than an economist."

Surely an economist's research program must be beyond "areas in which his advice is sought." And why should one worry too much about becoming to some extent an administrative assistant so long as he is effective in promoting the public interest? Being an economist as such is pleasant, but there are more important tasks to be done.

I recommend this book to those who want a ready reference on demand analysis or who wish to have the author's many journal articles under one roof. But the reader should expect no ready-built bridges between econometric analysis and the making of public policy.

John A. Schnittker

Introduction to Agricultural Economic Analysis. By C. E. Bishop and W. D. Toussaint. John Wiley and Sons. New York. 258 pages. 1958. $5.25.

THE AUTHORS, Bishop and Toussaint, have set themselves a difficult goal and have succeeded in reaching it. They have written a modern, readable text for undergraduates who are familiar with agriculture but are having their initial exposure to economic methods and analyses. Briefly, the authors range over the field of agricultural economics, keeping the level keyed to the "nonmajor" student who desires a collateral course but lacks a basic grounding in theory and mathematics. In one substantial but pleasant dose the book presents opportunity to grasp many of the very current ideas and techniques of economic science.

Dogmatically, and at the risk of sounding *ex cathedra*, this should become a standard text. It is head and shoulders above most of its competitors. Moreover, for graduate students and professional workers, it will serve as a concise, highly pertinent refresher. The book describes, explains and teaches, a remarkable achievement in itself—there are no bewildering or breathtaking *tours-de-force* at the expense of the general student. The authors have permitted no excursions into other fields of economics and the reader is firmly but gently kept at the task at hand.

Charts, graphs, and empirical examples are used liberally throughout the book. These tools help to display theory and to make the transition to practical problems. Modern, cogent situations are formulated to maintain interest and coincide with other studies and reality. Concentration on budgeting and accounting at the firm level is avoided and emphasis is placed where it should be, on true economic analysis. This latter approach, although unorthodox, is not unduly complicated, and it is highly commendable in view of similar works. For a book of this type, some might criticize the lack of student problems.

The book is divided into four parts: (1) Introduction, (2) Production and Supply, (3) Consumption and Demand, and (4) Economic Progress. It is well indexed and adequately documented. Most of the leaders and pioneers in this area are discussed and their contributions amplified on a consistent level. It is truly a heroic effort, despite the suspicion of professional heresy in omitting any reference to J. D. Black.

In the first part, one might question somewhat the terseness of the authors. In less than 30 pages, the economic organization of society is covered, agriculture is fitted neatly into its slot, and the basic role of the firm is described.

As one would expect, the section that deals with production and supply occupies the largest part of the book, and this is the most rewarding portion. The writers do an outstanding job of presenting production functions, diminishing returns, product and cost curves, and, astoundingly enough, a glimpse of input-output analysis. The practical examples given cover a wide variety of production situations, avoiding the common error of parochialism. The additional discussion of the firm included is well integrated with the primary subjects of the first and second parts. The text moves easily back and forth between micro- and macroeconomics at this stage. Uncertainty, risk, and decision making are well related on a nongraduate level.

Consumption and demand introduces the reader to such highly diverse concepts as price and income elasticity (in the reviewer's opinion, the most difficult of all concepts for the beginner), changes in demand, international trade, the factors of price change over time, and parity. A great deal is accomplished in a very few pages, and needs to be read to be appreciated.

The last part deals with changes and innovations in the economic and technical picture, real and estimated, and shows how prices and progress affect both the family farm and the entire demand-supply relationship. Problem areas within agriculture are discussed, going from the general to the particular, from poverty to geographic location of low-income farms.

The reviewer unhesitatingly recommends this book. It is well worth the time of anyone interested in agriculture or farming. The style, pleasant and painless, should not becloud the objectivity of the authors. They are simply superior writers with a thorough understanding of the subject and a definite goal in mind.

William W. Addison

Microeconomic Theory—A Mathematical Approach. By James M. Henderson and Richard E. Quant. McGraw-Hill Book Co., New York. 283 pages. 1958. $7.50.

IF ONE IS INTERESTED in a rigorous, mathematical restatement of orthodox text book price and firm theory, this is definitely a book to consult. This, however, is the whole of the contribution of this text, and one had better not tackle it unless he is already very well read and up-to-date, at least to the extent of a senior undergraduate reading for honors at a college that is noninstitutional in bias.

This book needed to be written, if only for graduate students preparing for their Ph. D. examinations. Aside from this rather limited market, its usefulness is likely to be small. There are no advances of import in the theory as such, and the strict, terse mathematical formulations cause a considerable loss in conviction. The theory of price is like a beautiful mannequin in a fashionable store window. When stripped of its clothes—the necessary verbal hedging and qualifications—the mannequin is perfectly proportioned but no longer beautiful or convincing. After all, we really cannot explain the rationale of consumer preferences satisfactorily, and 56 equations cannot change this fact. The book is written for those who already know the qualifications and reservations—it is sort of a guide to economics for economists.

All subjects of "microeconomics" are covered, including linear programming, theory of games, and the input-output system. However, the discussion of these and other specific tools of analysis is so short and concise as to be of value only to one who already has the basic knowledge and needs only refreshment.

This review is critical in tone not with respect to substance, but only because the reviewer believes that the market for and usefulness of a book of this kind is limited. The layman or practicing economist who is interested in what the science has to offer in price theory can better find out through Boulding or Steigler. The authors have done a brilliant job in restating microeconomic theory in mathematical terms. The question remains, Why?

William A. Vogely

Economic Forecasting. By V. Lewis Bassie. McGraw-Hill Book Co., New York. 702 pages. 1958. $8.75.

IN THIS reviewer's judgment Bassie's book on economic forecasting is the best there is. Contrary to the usual textbook that serves as a basis for a course in economic forecasting, most of Bassie's book is not devoted to a discussion of business cycle theory and a minute description of previous business cycles. Rather, it starts with the basic tools of the modern forecaster—the National Income Accounts—and shows in practical fashion how to use the expenditure-income flow analysis to provide an appraisal of where the economy is heading. The discussion of the materials available for the analysis, the strategic points to consider, and how the results can be used in terms of public policies or for specific industry forecasts are all detailed and clear.

Professor Bassie is no newcomer to this field. Beginning in the late 1930's, he was a Government forecaster for various agencies including the Federal Reserve Board and the Department of Commerce. Since 1948, he has been Director of the Bureau of Economic and Business Research at the University of Illinois. Further, he is no stranger to agricultural economists, having appeared at several of the Annual Agricultural Outlook Conferences in Washington.

In his most recent appearance in the fall of 1957, when the recession was beginning to take shape, Bassie emerged as the "great pessimist" predicting a substantial and deepening decline in economic activity. That Bassie was wrong in this instance is no reflection on his book. Few, if any, forecasters are always right. But he knows his tools for economic forecasting, and he has presented them well for novice and experienced forecasters alike.

Nathan Koffsky

Taxation of Agricultural Lands in Underdeveloped Economies. By Haskell P. Wald. Harvard Law School International Program in Taxation, Cambridge. Harvard University Press. 231 pages. 1959. $4.50.

WHATEVER THE CONDITIONS may be that set a nation on the path of economic development, there is little doubt that an appropriate tax system is among them. A repressive or inadequate tax system can easily discourage incipient growth. If wisely designed, however, tax measures can provide positive economic incentives and serve as an effective tool of national economic policy.

The Harvard Law School International Program in Taxation, sponsor of the study reported, has done much to improve our understanding of the role of taxation in economic development, notably through its publication of the Papers and Proceedings of its 1954 Conference on Agricultural Taxation and Economic Development. The present study is an outgrowth of that conference, which, in the author's words, "pointed out the problems and shortcomings of existing land taxes and underscored the large potential contribution a more effective system of land taxation might make to the financing of economic development in many countries."

As its subtitle indicates, this book is both a survey of existing land tax systems in various newly developing economies and a guide to policies for reform. In the first three chapters, the major systems of land taxation are described. The analysis draws heavily on the earlier conference volume, and includes a comprehensive and useful classification of the different types of land taxes. Part 2—Major Policy Guides—opens with a discussion of the theoretical basis for land taxation, and continues with two chapters on equity considerations, and one each on the relation of land taxation to agricultural development, economic policy regarding the role of agriculture in the total national economy, and tax administration. Part 3 contains specific suggestions for reform.

In the early stages of a nation's economic development, Wald points out in his introduction, agriculture is the dominant industry, and taxes on agricultural land are often the only promising means of tapping, in the required large amounts, the income of the agricultural sector. An effective land tax is thus of utmost importance to a country's economic growth. Yet few nations have succeeded in making land taxes a productive fiscal device. In 12 of the 21 nations for which data are given, the land tax produces 5 percent or less of the total tax receipts. Moreover, Wald tells us, there is ample evidence that land taxes have been losing ground steadily as a revenue source.

This failure to keep pace is attributed in large part to the inelastic character of the yield of most land taxes. The problem is most acute during periods of economic growth and inflation, such as occurred during and after World War II.

Land taxes that are levied on gross produce and collected in kind avoid this problem, and evidence indicates that nations that use such a tax (Mainland China and the Republic of Korea) stand at the top of the list in terms of the land tax yield as a percentage of total tax revenue. Administrative problems, however, argue against general adoption of this form of land tax, and Wald's general recommendations for improving revenue flexibility emphasize improved measures of the tax base, through a periodic land assessment supplemented by short-run adjustments for changes in agricultural prices or production.

A more urgent problem than revenue rigidity, in Wald's view, is the need to reform the land tax base "so that the tax rests on a sound land classification system and accords as closely as possible with presumptive net income." To this end, he gives attention to various possible techniques of land classification applicable to countries in various stages of development. His third proposed reform concerns the need to "personalize" the land tax by adapting it to the individual's economic circumstances.

The reasoning supporting these recommended reforms is convincing. It is based on a penetrating analysis of the theoretical issues in land taxation. If there is any weakness in Wald's argument, it probably is that he assumes a higher degree of administrative skill than is likely to exist in most underdeveloped countries. When one observes how rarely rural assessors in the United States employ such basic tools of assessments as soil classifications and land use capability maps,

one may well despair of the prospects for adopting these methods in less developed nations. And this is not to mention such added refinements as his suggested tax adjustments for hired labor and personal allowances for the taxpayer's marital and dependency status.

It is fortunate, however, that Wald does not limit his discussion to those measures that are immediately feasible in primitive circumstances, for what he has given us is a modern statement of the general principles of land taxation. In particular, his chapters on land tax rationale, on shifting and tax capitalization, and on considerations of interpersonal equity have wide applicability. In fact, many of the issues he raises concerning land tax policy deserve the attention of those concerned with the American property tax—for example, his contention in favor of instituting an *in personam* concept of property taxation for the time-honored *in rem* doctrine.

Standing almost alone in its field, this book is essential for anyone concerned with public finance problems in underdeveloped economies. More broadly, Wald's excellent discussion of basic land tax principles commends this book to the attention of the general student of taxation and land economics.

Frederick D. Stocker

The Staple Food Economies Of Western Tropical Africa. By Bruce L. Johnston. Stanford University Press. 306 pages. 1958. $6.00.

RECENT AWAKENING and developments in Africa have been unfolding so rapidly that the rest of the world is left groping frantically for adequate understanding and adjustment. This is particularly true of the United States, where active interest in world affairs appears to be aroused only in response to crises; thus the demand for information about Africa has become keen. Unfortunately, authentic information on the great tropical segment—the African heart—is still inadequate. It will be years before expanded research will yield a reliable body of knowledge on basic aspects of prevailing social and economic organizations in tropical Africa.

Promising beginnings have been made by various institutions and individuals, and Dr. Bruce Johnston's book is a welcome and outstanding addition. He applied himself to the basic subject of staple food crops in the western, and larger, portion of tropical Africa.

The importance of these crops (millets and sorghums, maize, rice, manioc, yams, cocoyams, sweetpotatoes, and plantain) derives from the fact that, even more than the publicized export crops of cocoa, coffee, peanuts, and palm oils, they permeate the agricultural pattern and dominate the African diets.

The result is a thorough and comprehensive book, which in 10 chapters and appendix tables covers all major aspects of the subject. The role of the staple food crops is analyzed in relation to economic development and the diet of the people; their distribution patterns are delineated and interpreted in terms of their own characteristics, the physical environment, economic factors, and cultural-historical influences; and prospects for changes in food consumption and production are appraised. Highly instructive also are the many tables and maps on climatic features, vegetation zones, crop distribution, population distribution, production and trade of staple crops and their relative caloric yields, nutrient composition and labor requirements, and other features that complement the text.

Agricultural economists will find the author's discussion and conclusions in the chapter, "Economic Factors in Distribution," most interesting. For example, in appraising the relative yields of the various staples in West Africa, the author ranks them against an index of "caloric yield per hectare." Millet-sorghum ranks lowest and manioc highest. But when considered from the angle of total area production, millet-sorghum ranks highest and manioc second.

Taking labor requirements as a basis for comparison, the author shows that in the forest zone of the Belgian Congo, manioc and plantain required the smallest number of total man-days per ton, and rice the largest. He shows similar comparisons for cost per 1,000 calories, and again manioc and plantain rank lowest. The author's analyses of relative prices and nutritional values of these staples are equally enlightening.

Agriculturists and economic geographers will be particularly interested in the three chapters on the physical environment, geographical distribution, and characteristics of the staple crops. Here is presented a detailed picture of the dominant physical factors in the area. This serves as a background for the maps and discussion on the patterns of crop distribution. Thus millets and sorghum emerge as dominant crops in the region, with rice leading in five territories and maize leading in one. Manioc is a close second, followed by yams.

Those interested in nutrition, trade in food items, and agricultural development in Africa will find the three final chapters rewarding. The relative positions of the starchy staples in African diets are shown for various regions. Methods of preparing food and seasonal variations in consumption are discussed. The author then proceeds to explain the factors that are likely to change the patterns of food production and consumption.

Wisely, Dr. Johnston approaches this complex and dynamic field with caution. Nevertheless, he arrives at interesting conclusions. For example, he sees "a growth in consumption of rice and wheat flour," . . . "that manioc is likely to increase in importance," . . . "a significant growth of technical knowledge of the means of raising agricultural output and productivity," and "that the expansion of agricultural output in most if not all of western tropical Africa will keep pace with the growth of demand."

Afif Tannous

Water Resource Development: The Economics of Project Evaluation. By Otto Eckstein. Harvard University Press. 1958. 300 pages. $6.50.

IN 1950 the Subcommittee on Benefits and Costs of the Federal Inter-Agency River Basin Commitee published its *Proposed Practices for Economic Analysis of River Basin Projects.* Until 1958, this "Green Book" stood as the only comprehensive treatment of the methodology of benefit-cost analysis. Not that progress ceased in this important field—after 1950 many excellent articles and books dealing with segments of the problem appeared. But 1958 was a banner year for benefit-cost theory. Eckstein's book and its companion piece, Krutilla and Eckstein's *Multiple Purpose River Development*, appeared almost concurrently with *Efficiency in Government Through Systems Analysis* by Ronald McKean. These works attempt to synthesize previous approaches and apply the developed criteria to examples of Federal water-development projects. All make important original contributions.

Professor Eckstein grapples manfully with the problem of criteria: Should benefits be maximized in terms of local resources, that is, should each river basin or watershed be developed so as to maximize net benefits; or should we consider as given a certain quantity of Federal funds and maximize potential benefits from its investment? While recognizing exceptions and modifications, he settles on the "budget constraint" as the most generally applicable approach.

Should the benefit-cost ratio or the rate of return be maximized? Eckstein demonstrates how the ranking of projects differs between the two methods. Capital intensive projects (construction costs high relative to annual costs) are favored by the benefit-cost ratio while capital-extensive projects are favored by the rate of return. Although he shows a predilection for capital-extensive projects (they commit fewer resources irrevocably), he recognizes that it is the capital-intensive project that typically is relegated to public investment. Also, with the assumption that rationing of capital via the budget is perpetual and fluctuations in its severity cannot be foreseen, he concludes that "if, in each year, those

projects are started which have the highest benefit-cost ratios, and if the marginal increment of each project has a benefit-cost ratio equal to the cutoff ratio of the program in the period, then the total return on Federal expenditures will be maximized."

Eckstein's forte is the treatment of risk and time. He demonstrates lucidly the differential effects on the benefit-cost ratio of different types of projects (different longevities, different degrees of capital intensity, different ratios of private to Federal funds), of the use of limits on the time period of analysis (as required by Budget Bureau Circular A47), and of the use of one interest rate for private and another for Federal costs. His major point, however, is that the interest rate on Government bonds may account for time preference but makes little, if any, allowance for risk or that the social cost of funds raised through taxes ranges between 5 and 6 percent. (This latter conclusion was arrived at by an empirical study, the results of which were published in the Krutilla and Eckstein books.) But he points out that through the political process society may demonstrate a lower discounting of distant future benefits than does the average individual, and concludes that the use of a 5- or 6-percent interest rate would discriminate against those projects that are best suited to public investment. He recommends using a lower interest rate and setting a minimum acceptable benefit-cost ratio, say 1.4, which would insure an average rate of return of about 6 percent on the Federal investment.

In addition, he treats the problems of price levels, cost of land, indirect benefits, cost allocation, reimbursement, cost-sharing—in fact, the gamut. After establishing his criteria, he applies them to current practices in the evaluation of flood control, navigation, irrigation, and electric power development, using selected projects as examples. He finds agency procedures wanting on various counts and makes recommendations for improvement.

It has been pointed out that although decisions for public investment in water development are made in the political arena, the arguments are almost always economic. Benefit-cost analysis, imperfect as it is, does eliminate some of the specious rationale. Such works as Professor Eckstein's help to reduce the imperfections in the analysis. Anyone working in the field should not only read this volume, but study it.

Robert C. Otte

Multiple Purpose River Development. By John V. Krutilla and Otto Eckstein. Johns Hopkins Press, Baltimore. xiv, 301 pages. 1958. $4.50.

THE ECONOMICS of water-resource development has received progressively greater attention during the past decade and a number of analysts have questioned the procedures and standards followed by Federal agencies in the formulation and economic evaluation of water-control programs. A few analysts have attempted to develop a conceptual model for water-resource development oriented to considerations of public welfare. *Multiple Purpose River Development* is one of three recently published books in this area. In a sense, these books culminate this decade of effort to develop an appropriate and rigorous system of economic analysis for use in the formulation and evaluation of public resource development programs.

The twofold objectives of *Multiple Purpose River Development* is indicated by its two-part organization. Part 1 is devoted to the development of economic concepts and the construction of a procedural apparatus. Part 2 is concerned with application of the theoretical foundation to three individual river-basin developments, the results of which are presented as case studies.

The initial focus in part 1 is centered on the unique characteristics of river systems and of their utilization and development that set them apart from other types of economic resources and their use. The authors ably develop the concepts of "interdependence of water control projects in a river system and indivisibility of river waters;" and they argue correctly that these characteristics

of river-basin development distinguish them from other resource use as assumed in traditional competitive theory.

Included also in part 1 is a careful statement of the concepts of economic efficiency and a review of traditional economic theory. The explicit welfare orientation of the discussion enhances its value and potential acceptance by many planners who have been reluctant to accept economic criteria in public development programs.

Chapter IV, "The Social Cost of Federal Financing," represents a distinguished pioneer attempt to measure the opportunity cost of public funds used in the construction of water-resource projects. This chapter will likely provide a subject for further discussion. It may have greater impact on water-resource planning and evaluation than any other chapter in the book, or perhaps any other recent work in the field of benefit-cost analysis.

The authors argue effectively that the interest rates used in the economic analysis of public projects should conform to the concept of opportunity cost. In so doing, they reject the widely held belief that the interest charge should represent the money cost of obtaining funds by the Federal Government.

In rejecting the public borrowing rate and the rationale commonly used in its support, they argue that "the American economy does not fit the competitive model closely enough to permit the use of so simple a procedure. The substantial risk premiums on the terms on which business can borrow and the rationing of credit to some businesses and to most consumers, preclude the existence of a unique rate of interest and prevent consideration of any single actual rate as a measure of the social cost of capital."

Authors Krutilla and Eckstein conclude, also in this chapter, "that since the market cannot be consulted for the price of capital, as competitive theory would suggest, it is necessary to derive an estimate by more complicated empirical procedures which take account of some of the complexities of the process by which savings are actually channeled into investments."

In approaching the first problem, a question is raised as to the source of additional tax revenue for project development, or conversely, the recipients of benefit from a reduction of taxes. Recognizing that the answer would depend upon the type of tax increase or reduction put into effect, the authors develop alternative models based on: (1) A change in tax levy that would have a relatively great effect on consumption; and (2) a change that would have a relatively greater impact on investment.

For each of the two assumed tax changes, the relevant interest rates for a large number of consuming and investing sectors of the economy are estimated and a weighted average is computed. On the basis of their calculations, the authors conclude that the social cost of funds derived from the two types of tax changes would range from 5.44 to 5.79 percent and hence that the opportunity or social cost of Federal financing is in the range of 5 to 6 percent, as opposed to the 2½ percent rate commonly used in evaluation of public projects.

One of the significant and interesting conclusions of the application of the analysis to selective case studies in part 2 is that the interest rate actually used in project evaluations is a primary determinant in the formulation of river-basin projects. In analysis of the Hells Canyon case, for example, the use of a 2½-percent interest rate would lead to the conclusion that the one large dam on the Snake River (Hells Canyon), which is proposed as a public development would be more efficient but that the use of a 5 or 6 percent interest rate would dictate a somewhat smaller scale of development.

In summary, this book points a finger to one of the most crucial questions on water-resource development and public policy. If the authors are correct in their conclusions on interest rate, it may be fairly concluded that many projects being justified and constructed may not be wholly in the public interest. The analysis leads also to the conclusion that the scale of projects currently being planned and constructed is far in excess of a scale of development that would be economically justified. This and similar conclusions reached by other analysts outside the Federal Government should lead to a careful reappraisal of the interest rate standards now used by water-development agencies of the Federal Government. The implication of the conclusions of this book may also be as far-reaching in other areas of public resource development as they are for water-resource programs.

William A. Green

Linear Programming Methods. By Earl O. Heady and Wilfred Candler. Iowa State College Press. 1958. 597 pages. $5.95.

FINGERS were the first digital computers. The only really new thing about an electronic calculator is its fantastic speed. It does simple arithmetic literally at lightning speed. This places a premium on the development of such formal techniques as linear programing, input-output analysis, and the theory of games. These are high-powered analytical vehicles capable of using the speed.

Until recently, the rapidly growing literature on linear programing was scattered widely in brief articles and papers, many of them written in highly technical language. This book is the second to bring a significant part of this scattered material into one volume and to present it in less technical form for the use of economists. The other book, *Linear Programming and Economic Analysis*, by Robert Dorfman, Paul A. Samuelson, and Robert M. Solow (McGraw-Hill Book Co., Inc. 1958) was reviewed in the July 1958 issue of this journal.

Dorfman, Samuelson, and Solow emphasize the relationship of linear economics to traditional economic theory. Heady and Candler stress the formulation and solution of problems. The two books are thus complementary, and both should be in the working library of aspiring programers.

The special merit of the Heady-Candler volume for agricultural economists is that the explanation of methods and procedures is well illustrated with examples from practical agricultural problems. The mathematical portions of the exposition are simple and straightforward. The presentation is helpful for those who are still learning to walk on programing paths, but it will prove particularly useful also to those who have learned to walk and are ready to get out on the electronic freeway and operate at high speed.

The 17 chapters in the book fall naturally into 2 parts. The first part, chapters 1 through 10, contains a consistent, logical development of linear programing from basic concepts through the computational procedures for solving mill-run problems.

The second part of the book includes the remaining 7 chapters and is more technical. These chapters cover the elements of matrix algebra and a number of types of analysis related to linear programing. Among these are input-output analysis, theory of games, and nonlinear and risk programing.

The stated purpose of the authors is to write so as to place the tool of linear programing in the hands of those who are not primarily mathematicians. The first part of the book, especially, is intended to reach graduate students and advanced undergraduates as well as established economists.

The chapters in the second part are useful stepping stones for those who want to go further into explanation of method. Chapter 11, Elements of Matrix Algebra, is an excellent introduction for those who have not explored this area of mathematics. The chapter on Theory of Games and the one on Nonlinear and Risk Programing are well worth reading.

Many of the books issued by the Iowa State College Press would benefit from more careful editing to avoid noticeable solecisms and slips in syntax. Some in this book are sufficiently intrusive as to detract from the general clarity of the exposition. For example, the sentence in the preface that reads, "These chapters provide the knowledge for solving most of the practical problems which arise in agriculture and other industries," is not sufficiently explained and may be misunderstood. There are other statements that may leave the casual reader with the impression that the authors have unconsciously allowed the problem to be obscured by the method in their vision of linear programing.

The truth is that in solving them, we have always faced economic problems of the kinds discussed and we have used and will continue to use a variety of analytical tools. Linear programing is only one of these tools. It is important now to learn all we can about it in order to make the most of the powerful new computing methods. Linear programing also gives a new and stimulat-

ing view of old problems, and this too is worthwhile.

Finally, this book will be widely and profitably read by agricultural economists of all degrees who want to become more familiar with linear programing. It will help them to choose the least-cost mixture of analytic methods for solving problems.

Ronald L. Mighell
Burton L. French

Bibliography of Food and Agriculture Marketing. Food and Agriculture Organization of the United Nations, Rome, Italy. 210 pages. 1958.

THE PURPOSE of this bibliography is to help workers in marketing to overcome some of the obstacles to a greater awareness of international experience. It concentrates on publications in countries other than the United States and Canada, because of the immediate need for such material written in languages most easily read by those likely to use it.

FAO Marketing Guides. Number 1.—*Marketing Problems and Improvement Programs.* 260 pages. $2.50. Number 2.—*Marketing Fruit and Vegetables.* 205 pages. $2. Food and Agriculture Organization of the United Nations, Rome, Italy. 1958.

THESE ARE PUBLICATIONS in a new FAO series designed to meet the general demand for information on methods of improving the handling of agricultural products between the producer and consumer, avoiding wastage, and reducing costs.

Coffee in Latin America. Productivity Problems and Future Prospects. I—*Columbia and El Salvador.* Food and Agriculture Organization of the United Nations. Columbia University Press. 144 pages. 1958. $1.75.

The State of Food and Agriculture 1958. Food and Agriculture Organization of the United Nations. Columbia University Press. 222 pages. 1958.

The Case for an International Development Authority. By Commander Sir Robert G. A. Jackson. Edited, with an introduction by Harlan Cleveland. Syracuse University Press. 70 pages. 1959.

Selected Recent Research Publications in Agricultural Economics Issued by the United States Department of Agriculture and Cooperatively by the State Colleges [1]

ANDERSON, K. E., AND HAWES, R. L. MILK CONSUMPTION IN NONPROFIT SUMMER CAMPS. U.S. Dept. Agr. Mktg. Res. Rpt. 333, 22 pp., illus. June 1959.

In a survey of 109 nonprofit summer camps in 3 Northeastern States, it was found that the number of times milk was served each day, the milk purchasing practices followed by camp directors, the number and kinds of competing beverages available, and methods of serving have an appreciable effect on the level of milk consumption.

[1] State publications may be obtained from the issuing agencies of the respective States.

BAKER, R. L. INTEGRATING EGG PRODUCTION AND MARKETING. U.S. Dept. Agr. Mktg. Res. Rpt. 332, 46 pp., illus. June 1959.

Analyzes circumstances responsible for growth by integrated operations in egg industry and appraises their future importance in egg marketing. Integrated methods of producing and marketing eggs are resulting in reduced unit costs for many firms in the egg industry.

BARLOW, F. D., JR., COOPER, A. S., JR., AND VIX, H. L. E. POTENTIAL MARKETS FOR PARTIALLY ACETYLATED COTTON. U.S. Dept. Agr. Mktg.