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## BOOK REVIEWS

**Farm Management and Agricultural Economics—An Introduction**, J. B. Hardaker, J. N. Lewis and G. C. McFarlane. Sydney: Angus & Robertson, 1970. P. vi, 201. \$4.95.

This book will be warmly welcomed by teachers, students and others interested in the economics of agriculture in Australia. The authors introduce some of the basic concepts and principles of economics and show the relevance of the principles to Australian agriculture. The clear and positive discussion of the economic implications of the numerous policy proposals past and present in Australian agriculture and the general emphasis towards assisting practical decision-making are features of the book.

The book will be particularly useful as a text for high school and college students and should also appeal to a much wider audience of people connected with agriculture. It is concisely written with a minimum of descriptive material and seeks to encourage critical thinking by the reader. The authors have wisely not attempted to provide blueprint policy measures for Australia, but rather the fundamentals for an understanding of the implications of the policy proposals, presented in a way which will challenge the reader to think about the implications.

The individual who has no recourse to a teacher or discussion leader may find the treatment of some concepts and some policy issues too brief. Also as the book was largely written before 1969 the severe prices/income situation which developed during 1970 and the various policy solutions proposed are not discussed. It is to be hoped that these will be included in a revised edition of the book to make it an even more effective contribution to Australian agricultural economics literature.

The book is divided into three parts: "Basic Concepts and Principles of Economic Theory", "Farm Management", and "Marketing and Agricultural Policy". An introductory chapter sets out the main aim and reason for the book and also includes a guide for the order in which chapters might be read. A brief index also adds to the effectiveness of the book.

Part 1 begins with chapters dealing with the economy and industry wide concepts of scarcity and value, demand, supply and the equilibrium price, and the special nature of demand and supply in agriculture. Then follow chapters concerned with the production economics of the individual firm; input-output relations, resource allocation and cost analysis. The presentation is concise and requires only a minimum of mathematical understanding. Such topics as marketing margins, livestock cycles and opportunity costs are discussed.

Part 2 opens with a discussion of the role and functions of management and the steps in rational decision making are listed and explained.

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Detailed examples of inventory and physical records are given and the various adjustments required to use the basic records. Valuation and depreciation are considered. The key factors affecting performance are enumerated. The final chapter in part 2 presents the various forms of farm budgets and shows how they can be used in choosing between alternatives. The section dealing with break-even and parametric budgets is necessarily somewhat mathematical. Long-term, cash flow budgets are discussed although with less emphasis than is appropriate in the light of the income crisis which has become more pronounced since the book was written. Discounting and decision trees are also included.

Part 3 includes discussion of the importance of agriculture in the national economy. Agricultural marketing is well-presented. Grading, vertical and horizontal integration, and co-operatives are all considered in the Australian context. A discussion of the various methods of government intervention in the market, and their effects on resource allocation precedes the chapter on "Agricultural Price Policy in Australia", which includes a brief review of price programmes for selected agricultural commodities. The final chapter deals with international trade and commodity policy and includes discussion of comparative advantage, tariff protection and trade agreements. It is in part 3 that the positive approach of the authors in discussing policies and proposals in the Australian setting is most welcome.

D. E. MACCALLUM

*Department of Agriculture, Sydney*

(Editor's comment: The following review is a primary producer's assessment of the same book.)

One of the most challenging tasks facing the agricultural economist is to convey his specialized knowledge in practical terms to those most in need of it—the politician, the industry leader and the farmer himself. So much of the very good work conducted in the field of agricultural economics is published in professional journals and specialized texts and it is indeed refreshing to find a publication which the layman can read and understand with a minimum of difficulty.

To present a detailed study of all aspects of the economics of agriculture, farm management and agricultural policy in a relatively slim volume of less than 200 pages is a difficult task, and the authors make no such claim. Rather, their work is intended to illustrate the basic principles of economic theory as applied to agriculture and the implications for farm management, and to give a concise account of the nature and scope of agricultural policy.

In this review I wish to emphasize those parts of the book which are of particular relevance and interest to the practising farmer. Other aspects are dealt with in an accompanying review of this book.

In part 2 of the book, management is defined, a system of record keeping is presented, and the two are tied together by the final chapter in this section. This chapter describes a decision-making process of listing, evaluation, comparison and choice between alternatives. This approach

is especially valuable to practising farmers who sometimes display an alarming lack of knowledge of the basic relationships between inputs, outputs and the level of production of their own properties. The techniques of evaluation and budgeting shown here will, if put into practice, provide the farmer with a detailed knowledge of his own situation and therefore aid his managerial ability at the small cost of some straight forward arithmetic. It is a pity that some discussion on methods of financial control and the obtaining of finance is omitted from this otherwise complete treatment.

Part 3, comprising chapters 11 to 15, deals with the currently popular field of agricultural policy. It is unfortunate that the book was written prior to the latest developments in this area—wheat quotas, the collapse of the wool market and subsequent subsidy, and the rural reconstruction scheme—for the subject is so well treated in the book that the author's comments on these events would have been well-worth having. Chapter 13 gives an excellent account of the methods used by governments to intervene in the market, pointing out the inappropriateness of such methods. It is in this chapter that the book reaches its heights, for the treatment of a subject which is close to every farmer's heart, namely the support measures he relies on, is such that it provides the logical mind with the opportunity to realize the adverse effects of these policies while avoiding the derogatory style of other writers on this point.

The remaining chapters are devoted to a discussion of agricultural policy in Australia and aspects of international trade and commodity policy. Objectives of policy and their implementation are discussed and the inevitable conclusions reached as to their unsuitability. This is followed by a description of some institutional restraints on policy making and the methods used for some commodities. International trade is introduced via the theory of comparative advantage and continues to an examination of arguments in favour of protection. Various international attempts to rationalize trade are also discussed, including the International Trade Organization and the General Agreement on Trade and Tariffs. The chapter ends with discussion of other bodies such as the Food and Agricultural Organization and some aspects of international commodity agreements.

As an introductory text for students of agricultural economics this volume will be of great value, but it is more than that. It provides a concise account of what agricultural economics is all about and its implications for practical farm management and agricultural policy in a style that is very readable and without omitting anything of importance. It is to be hoped that it reaches beyond professional and academic circles to those who will most benefit by its contents.

P. M. FORD

*"Goondoee," Goondiwindi*

**Economic Models and Quantitative Methods for Decisions and Planning in Agriculture: Proceedings of an East-West Seminar**, edited by Earl O. Heady. Ames: Iowa State University Press, 1971. Pp. viii, 518. \$US10-50.

In 1968 a seminar was held in Hungary with the aim of presenting current thinking towards agricultural planning by economists from both western and centrally planned economies. Representatives from the United States, Poland, Hungary, Russia, Yugoslavia, United Kingdom, Czechoslovakia, Romania, Germany, Canada, France, Sweden, Austria, Norway, Italy and The Netherlands discussed the use and application of economic models and econometric techniques to the problems of agriculture. The present volume contains, *in toto*, the papers presented and the formal discussion from the seminar. The ubiquitous Earl Heady has assumed editorial responsibility.

The standard of the contributions varies considerably and more than one of the chapters written by socialist economists is spiced with official doctrine. The twenty-six chapters are grouped into six parts, the first of which provides background information to planning and decision models generally. Part 2 (problems at the microlevel) gives a rundown on the familiar tools of quantitative analysis applicable to micro environments. Unfortunately two recent developments are notable by their absence: these are Bayesian statistics and systems analysis. Virtually the only reference to both these procedures, which undoubtedly have a big role to play in future planning at all decision levels, is given cursorily by Tweeten in a discussion paper to Tintner's chapter in part 1. It is true that many of the methodological developments in both fields have taken place since the original seminar was held, but specific attention should have at least been drawn to their potential in agricultural planning.

Part 3 is concerned with regional models and part 4, national models. Both theory and practice are covered and in part 4 models of national agriculture in five countries are outlined and discussed. The final two parts consider problems in formulating such models and the differences between planned and realized performance respectively.

It is almost certain that the participants at the original seminar gained more from the contributions than will be possible for interested readers afterwards—this seems universally the case at conferences. The informal discussion which took place (half a day was devoted to each paper), plus correspondence arising from contacts made during the course of the seminar are not available to outsiders. More specifically, some discussants posed questions of clarification or elaboration which presumably were answered during subsequent discussion. Unfortunately, however, no record of the answers are contained in the present book. It was intended that they be included, but problem of space precluded this; it is intended that a summary of the remaining discussion can be published in due course.

Then there is the time delay between the seminar and publication, during which methodological developments have taken place on a broad scale. Empirical results and experience gained by planning modellers too would presumably have been considerable in the intervening period. All these considerations lessen the usefulness of the book to economists and planners in Australia, but in no way detract from the commendable actions of those who fostered the seminar originally. Similar gatherings in the future at a professional level hold a great deal of hope for crossing geo-

graphical and ideological boundaries and the resulting cross-fertilization of ideas will undoubtedly benefit all concerned.

DAVID B. TREBECK

*Department of Agriculture, Sydney*

**Microeconomics and Decision Models of the Firm**, by T. H. Naylor and J. M. Vernon. New York: Harcourt, Brace and World, Inc., 1969. Pp. xiv, 482. \$12.35.

Traditionally, microeconomic texts have associated the problem of the firm (or entrepreneur) with marginal analysis. This approach stemmed from the work of Cournot, who first defined profit maximizing conditions relative to total revenue and total cost functions, and from von Thunen, who showed that total product is maximized only when resources are allocated equimarginally. Subsequently a plethora of publications has emerged which has extended, refined, confused and applied this basic principle.

The present book differs from tradition in two respects. First, the authors contend that the marginal analysis (neoclassical) model is just one of several economic models of the firm. Second, the presentation is decision oriented. This is not to say that the book provides a whole new revolution in economic thought—far from it. Most of the material has appeared before and the book itself is a flow on from the senior author's doctoral dissertation. The authors suggest as their audience: advanced undergrads, beginning graduate students in microeconomics and managerial economics, and as a reference book for management science, operations research, and business administration students.

The firm is assumed to consist of four loosely-defined elements: goals, production transformation processes, information, decisions. Since the subject of goal formation provides much controversy among economists, the authors take pains at the outset to restrict the treatment to the goals of "objectively rational" managers of business firms, classified into (1) profit maximization, (2) functional goals, (3) personal goals. Given this orientation, the book is normative (i.e., how managers should make decisions) although it becomes positive (how managers do make decisions) when the real world behaviour of firms is considered.

The marginal analysis (neoclassical) model of the firm is developed over four chapters. A chapter is devoted each to the three types of information possessed by the firm: product-demand, production-technology, factor-supply. Hardly surprisingly, there are no startling revelations here, but rather a reiteration of standard neoclassical theory. In chapter 5 the neoclassical model is critically appraised and both dissenters' and defenders' views are documented. This section is a useful summary and would save the "crash" student a mass of reading and probable frustration. Mathematical programming models (linear programming, quadratic programming and integer programming models) are discussed in chapters 6-10. The theory of each model is outlined and examples from the literature are quoted by way of application. Economic interpretation and a comparison with the neoclassical model is provided. A host of

references allows the serious reader to explore more widely and to become familiar with the contributions of the founding fathers.

The next section contains a chapter on dynamic models and one on stochastic models (written by E. T. Byrne). Both these chapters are sketchy and amount to little more than a brief chronological literature review. Of more substance, due to Naylor's association with research in this field, is the section on computer simulation. The essence of simulation is explained in chapter 13 and an application (initially reported by Chu and Naylor in *Management Science*) described in the following chapter. Finally, brief sections are provided on investment models of the firm, game theoretic models and behavioural models.

Overall the book is somewhat disappointing. Not enough attention is paid to integrating and comparing and contrasting the models described. Thus some chapters degenerate into a descriptive chronological review—suitable certainly for a reference book (and here copious references are provided for further reading) but not for a text book. The final chapter on behavioural models, especially, could have been enlarged and compared with traditional theory more fully.

A small point is that a total of 58 pages is devoted to references at the end of chapters. With some more thought by the publishers considerable duplication could have been reduced by, say, providing references only at the end of each part. Maybe even some cost savings could have been passed onto the consumer.

DAVID B. TREBECK

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**The Demand and Supply of Public Goods**, James M. Buchanan. Chicago: Rand McNally, 1968. Pp. ix, 214. \$6.85.

This book is an application of the conventional analytic tools to the understanding of public choice. The author adopts the fundamental laws of behaviour of decision-making units in private choice as a basis on which to build a theory of the demand for and the supply of public goods, and of the institutions which provide public goods. The book represents an important contribution to the theory of public goods.

The author states two primary purposes of this book. Firstly, he is intent on stating the necessary conditions for efficiency in the demand for and supply of public goods and examining the implications of these conditions. The reader is introduced to the analysis through a simple two person—two good model (one public—one private good) which then is complicated gradually by the introduction of impure goods, many goods, and many persons. The author uses the Edgeworth-box diagram, a mathematical exposition and the Marshallian geometry in his discussion of the necessary conditions.

The author's second primary purpose is to incorporate the costs of negotiating agreements and to develop an economic theory of political constitutions. The implications of the simple-majority and the unanimity voting rules for the provision of public goods and for the sharing of their costs are explored. However, the author does not discuss the efficient

sizes of membership of sharing groups, i.e., the optimal population. He has left this problem to be dealt with in his later work. The book presents a lucid and comprehensive treatment of the theory of public goods at an advanced level. The bibliographies which are included at the end of most chapters adds to the suitability of this book as a text for an advanced course.

D. R. GALLAGHER

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**Monetary Theory**, edited by R. W. Clower. Penguin Modern Economics Reading Series, Penguin Books, 1969. Pp. 360. \$1.70.

Immediate insight as to the diversity of acceptance of classical and contemporary monetary theory is gained via the opening paragraph in the book's introduction. Statements such as "standard text books on money and banking convey a false impression of the authority of received doctrine" and "contemporary monetary theory is among the least settled branches of economic analysis" provide the clue as to the book's purpose—"the continuing quest for the theoretical understanding of monetary phenomena".

Whether one can expect that this impressive collection of miscellaneous writings will afford the reader sufficient coherence of comprehension for the development of an integrated framework of monetary theory is debatable. The reader, nevertheless, is provided with a sound cross-section of the complex and typically controversial theories surrounding the function of money in the economy, ranging from the "historical" proposals of Jevons, Walras and Marshall to those of the modern day pundits such as Hicks, Samuelson and in particular, Friedman.

The book, divided into five basic sections, initially outlines the nature and function of money in the economy (Part 1) and thence traces the development of monetary theory through the classical quantity propositions (part 2) to the contemporary Walrasian equilibrium analysis (part 3) and Keynesian monetary theory (part 4), then ultimately to some recent propositions as to the significance of the role of money in the context and of economic growth (part 5).

*Monetary Theory* represents good value to the reader interested in obtaining a basic knowledge of the hypothesis underlying the development of traditional and modern monetary theory. Ample reference to eminent authors is presented and the editing of each particular section will prove of value to the reader.

Perhaps a major benefit to be gained from the book is an appreciation of the divergence of opinion held by leading theorists as to the function of money in the economy and this implication is frequent throughout the book. However the conflicting ideologies amply presented in *Monetary Theory* will prove valuable in promoting the discussion and debate so essential to the comprehension of monetary economic reasoning.

D. T. VERE

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**Growth Economics**, edited by Amartya K. Sen. Penguin Modern Economics Readings Series, Penguin Books, 1970. Pp. 553. \$2.10.

This book attempts to trace the theoretical developments in "Growth Economics" from the days of Domar (1946) and Harrod (1939) when Domar could say that "the rate of growth is a concept which has been little used in economic theory". Twenty-one of the leading papers on various facets of "Growth Theory" are included. There is in addition an introductory chapter by the editor, which provides a fairly comprehensive literature review, followed by 146 references.

The contents are as follows:

Part One. The Harrod-Domar Model

- 1 R. F. Harrod: *Dynamic Theory*
- 2 E. Domar: *Capital Expansion and Growth*

Part Two. Neo-Keynesian Distribution Theory and Growth

- 3 N. Kaldor: *Model of Distribution*
- 4 L. Pasinetti: *Profit and Growth*

Part Three. Ingredients and Types of Equilibrium Growth

- 5 Joan Robinson: *Model of Accumulation*
- 6 R. F. Kahn: *Analysis of Growth*

Part Four. Factor Substitution and Neo-Classical Growth

- 7 R. M. Solow: *Model of Growth*
- 8 E. S. Phelps: *Accumulation and the Golden Rule*

Part Five. Critiques of Basic Growth Models

- 9 T. W. Swan: *Golden Age and Production Functions*
- 10 A. K. Sen: *Interest, Investment and Growth*

Part Six. Money and Growth

- 11 J. Tobin: *Dynamic Aggregative Model*
- 12 H. G. Johnson: *Money in a Growth Model*

Part Seven. Two-Sector Growth Models

- 13 R. M. Solow: *Uzawa's Two-Sector Model*
- 14 F. H. Hahn: *Two-Sector Growth Models*

Part Eight. The von Neumann Model

- 15 T. C. Koopmans: *Maximal Rate of Growth*

Part Nine. Technology and Growth

- 16 N. Kaldor and J. A. Mirrlees: *Growth Model with Induced Technical Progress*
- 17 F. H. Hahn and R. C. O. Matthews: *Growth and Technical Progress: A Survey*

Part Ten. Measuring Contributions to Growth

18 R. M. Solow: *Technical Progress and Productivity Change*

19 D. W. Jorgenson and Z. Griliches: *Explanation of Productivity Change*

Part Eleven. Public Policy and Growth

20 F. P. Ramsey: *Optimal Growth*

21 E. S. Phelps: *Growth and Government Intervention*

**General Theory, Social, Political, Economic, and Regional, with Particular Reference to Decision-Making Analysis**, Walter Isard, in association with Tony E. Smith and Peter Isard, Tse Hsiung Tung and Michael Dacey. Cambridge, Mass.: The M.I.T. Press, 1969. Pp. xlv, 1040. \$10.00.

Once, idly riffling through a review of Claude Levi-Strauss's *La Pensée Sauvage*, in accordance with the time-saving policy of reading the critiques of the great works rather than the works themselves, I was startled to come upon a reference to linear programming. The suggestion was being put forward that certain anthropological phenomena could be formulated as problems of constrained maximization, and were therefore amenable to solution by the magic of the Simplex method. Mark up one point for inter-disciplinary cross-fertilization.

A memory of that encounter sprang to mind when I first picked up the volume at present under review. But here we are in a different dimension. With a breadth of vision that is positively "Cinemascope", Isard and his colleagues at the University of Pennsylvania have attempted to synthesize a single unified theory of individual and group behaviour from the fields of economics, sociology, political science, psychology, geography, operations research and anthropology. The book containing the fruits of their labours is enormous and forbidding; you could fill quite a respectable sized volume out of the table of contents and the index alone. Walter Isard would probably be acknowledged as one of the fathers of regional science. His contribution to this area has been of fundamental insignificance, particularly in his two major works *Location and Space Economy* (1956) and *Methods of Regional Analysis* (1960), both widely used as standard references in this field. It turns out that he sees these books as the first two of a connected series which "threatens to be at least a quadrilogy", and in which the *General Theory* is the third volume. This book differs from the earlier ones in two main ways. Firstly, it is much broader in scope, looking beyond purely regional frontiers into more general economic and social systems. Secondly, it has a strong orientation towards an axiomatic decision-theoretic view of the behavioural processes under study.

The book falls into two major parts. In the first, covering nine chapters, the various partial equilibrium decision analyses are painstakingly put together. The authors rely heavily on game theory and indeed there is not a great deal of new material in the first eight chapters, which begin with individual decision making in a fairly simple framework and conclude with a treatment of coalitions and  $n$ -person games. Chapter 9, however,

develops the remarkable insights which are yielded by the application of game theory to the classical location problems of Weber and Hotelling. Some intriguing possibilities are presented when the notion of space (and therefore location) is broadened from purely physical terms to encompass economic, political and social interpretations.

The second part of the book brings together the eponymous "general theory". It is built up in verbal and mathematical terms from a simple single regional beginning, through to a general equilibrium system put forward in linear programming and input-output format. "Non-economic" commodities are explicitly introduced, including such sturdy virtues as solidarity, respect, rectitude, affection, sociality, enlightenment, and "love-tendered" (i.e., giving without expectation of reward). The theory encompasses the production and exchange of both economic and non-economic goods and incorporates explicitly the decision-making behaviour of individuals and groups within the system. Political variables are built in: votes, elections, taxation, legislative decisions, etc. In a final chapter, some suggestions are offered for further research, and we are allowed to glimpse the author's megalomaniac visions of still greater and more general theories yet to be formulated.

This is a difficult book to read. The authors have taken much of their analytical apparatus from conventional theory, but in order to synthesize it all together, they have felt compelled to redefine almost everything. As a result a number of new and largely unnecessary words and phrases have been contributed to the English language, and the reader who dares to dip into the book rather than start at the beginning, will soon become dizzy with words like *rutilgrets*, *specificity-diffusion*, *transinal ulity*, *affectivity neutrality*, and many more. Indeed, this relentless drive towards neologism will greatly restrict the book's usefulness as a supplementary text, for example, in mainstream economics courses. The book contains some useful expositions of traditional microtheory, yet students are likely to find this material as inaccessible as if it were written in Latin. Even the gallant voyager who starts at page 1 will encounter some stormy weather before he has progressed far. The style is dense and tendentious. Furthermore, the obsessional quest for systematization sometimes leads to emptiness, with the reader wondering whether he is learning anything at all. To take an example at random:

"For each individual and organization, and for the aggregate of individuals and organisations and exporting units in region  $L$ , a negatively-sloping demand curve for  $c$ -enlightenment (*sic*) may be said to exist. Also, as with  $c$ -respect, for each individual and organization in region  $L$  and for the aggregate of individuals and organizations in region  $L$ , a typically positively sloping supply curve of  $c$ -enlightenment may be said to exist. On the market in region  $L$  for  $c$ -enlightenment the equilibrium market price may be determined by the intersection of these aggregate demand and supply curves." (P. 580.)

The coverage of the literature is extensive, yet there are some odd omissions. It is surprising to find no mention of Bayes in a volume so heavily

engrossed with decision theory. Equally surprising, in chapters dealing with the spatial organization of production, writers such as Enke, Takayama and Judge do not rate a mention. Perhaps most curious is the lack of attention paid to the welfare theorists.

One can only gasp in awe at the amount of work which must have gone into this monumental volume. It is also impossible not to be impressed by Isard's enormous analytical vision, extending as it does over economic, political, sociological and geographic domains. One must admire his urgent desire to integrate all these areas into one formal framework. He may have succeeded. But this book will have some difficulty in getting his message to the people. It will, however, be widely read in the University of Pennsylvania's Department of Regional Science, where it is the text in the second year basic theory course in the Ph.D. programme.

C. D. THROSBY

*Macquarie University*

**New Zealand Beef: Production, Processing and Marketing**, edited by A. G. Campbell. Wellington: New Zealand Institute of Agricultural Science, 1970. Pp. xiv, 638. \$NZ7.50.

Despite the spectacular growth of, and interest in, the Australian beef industry in recent years, there has not been available until now a corresponding amount of information describing the various facets of the industry. This has been unfortunate, because with the increase in the number of new and presumably often inexperienced beef producers entering the industry, mistakes due to lack of information would have frequently occurred, resulting in financial loss to both the individual producer and the nation. This deficiency has to a large extent now been overcome with the publication of *New Zealand Beef*, a book compiled via the New Zealand Institute of Agricultural Science.

The fact that the book relates to New Zealand rather than to Australia means that some sections are irrelevant for readers in this country. However, this disadvantage is largely offset because the book harnesses the efforts of 64 contributors and, implicitly, the 1,100 active professionally-qualified members of the institute. Such an organization is in a unique position to be able to seek and assemble information relating to each aspect of the beef industry.

There are six main sections: Industry Statistics and Economics; Breeding and Reproduction; Nutrition and Management; Disease Prevention and Control; Marketing and Processing; Education and Extension. Each section, and the book as a whole, are prefaced by two or three concise terms of reference within which succeeding chapters are couched. A collator provides an introduction, review and conclusion so that the subject matter for each section can be skimmed quickly. Not content to leave the treatment at this point, there then follows an appendix in which 39 separate recommendations are made. This is perhaps, from the New Zealand beef industry's viewpoint at least, one of the most valuable functions of the book, simply because it represents expert advice for the future of the industry from a group of independent observers.

There is finally a 900-item annotated bibliography of books, articles and theses which have appeared in New Zealand during the period 1950–1969. From an Australian reader's point of view, it is a pity that Australian references are not included, but this of course cannot be regarded as a criticism of the book.

The coverage throughout is professional but not jargonistic. If one is interested in any of the following topics then the book contains relevant information: carcass appraisal and grading, bloat, marketing systems, artificial breeding, cattle health and disease and its control, budgeting, reproductive performance, data processing, factors affecting meat quality, retail traders' requirements, cross-breeding, future markets, nutrition, performance testing and genetic improvement, herd management, beef cattle milk yields, general economic analysis, intensive feeding.

Perhaps the most impressive aspect of *New Zealand Beef*, to this reviewer, is the layout of the book. There is little if any overlapping of subject matter between chapters. Moreover, successive chapters flow naturally from preceding ones. This is rarely achieved in multi-author books these days and the credit is due to the organizing committee and in particular to the editor. Most importantly, *New Zealand Beef* can be confidently recommended to anyone in Australia connected with the beef industry.

DAVID B. TREBECK

*Department of Agriculture, Sydney*

**The Reluctant Farmer—The Rise of Agricultural Extension to 1914**, Roy V. Scott. Urbana: University of Illinois Press, 1971. Pp. xi, 362. \$US8.95.

Current preoccupation with the world population explosion and the spectre of food shortages has given renewed vitality to Jonathan Swift's dictum that among the greatest benefactors of mankind would be "whoever could make two ears of corn or two blades of grass to grow upon a spot of ground where only one grew before".

To double the number of blades of grass in a given area, it was not enough that scientists should discover ways of improving agricultural production. An equally important problem has been how to communicate this new knowledge to farmers and get them to put it into practice.

The theme of Professor Scott's book is that the "reluctant farmer" in the United States was eventually persuaded, indeed converted, to progressive farming practices as a result of agricultural education carried direct to farmers through the agency of the Agricultural Extension Services. The Extension Service as an agency, however, was not finally and firmly established until after a successful method of agricultural education had been slowly evolved through trial and error. The method was primarily that of demonstration.

Australians may wonder why the Agricultural Extension Service developed in a different institutional framework in the United States as compared with Australia. Why were the State Departments of Agriculture bypassed in the United States in favour of a system in which the State

agencies were the land-grant colleges and universities? The obvious answer, that there is no equivalent in Australia to the land-grant college system which was created in the United States by the Morrill Land-Grant Act of 1862, is not only too simple, but partially misleading. It was not until 1914, that the Smith-Lever Act established the Federal-State Co-operative Extension Service and formalized the relationships between the United States Department of Agriculture and the State land-grant colleges. functions of the State Departments of Agriculture were thereafter limited in practice chiefly to regulatory ones.

Yet in the interim between 1862 and 1914, this was not a foregone conclusion. Nor could the primacy of the roles of the Federal Department of Agriculture and the State land-grant colleges be predicted from the beginning. On the other hand, the common view among Americans that agricultural extension was a creation of the Smith-Lever Act of 1914, is erroneous.

Professor Scott's aim is to explore the origins and development of agricultural extension *before* 1914, the emphasis being on the period 1862-1914. In this context, the significance of the Smith-Lever Act is seen as merely giving a greater formality, comprehensiveness, and permanence to the most successful institutional arrangements that had already evolved after various possibilities had been tried at various times and places, either on a local or a more widespread scale. The historical fact that the institutional arrangements grew out of particular circumstances of time and place in the United States should serve as a salutary reminder that this impressively successful system of agricultural education would not necessarily be so successful if transferred intact to other places where historical processes have been different.

Professor Scott is not, however, so much interested in the agencies as in the methods of agricultural education. These, presumably, might have much more widespread relevance.

This book gives a useful historical summary of the development of both agencies and methods. Individual pioneer advocates of progressive agriculture exercised enthusiastic though limited influence as early as the eighteenth and the early nineteenth centuries. Among the most illustrious of these enlightened gentlemen farmers were Thomas Jefferson and Edmund Ruffin, both of Virginia.

The first groups to use their influence to improve agriculture were the agricultural societies, which typically held shows or fairs. The first recorded such fair, held in 1810, was instigated by a Massachusetts farmer, Elkanah Watson, who had recently acquired a pair of Merino sheep which he wished to display. The golden age of agricultural societies was 1850 to 1870. During this time the local societies co-operated to establish a national agricultural society, the main achievement of which was to contribute to the public opinion and pressure on Congress which led to the passage of the Morrill Land-Grant College Act in 1862 and to the creation of the United States Department of Agriculture. The primary function of the local agricultural societies continued to be the holding of annual fairs with prizes for the best exhibitions.

Professor Scott sees agricultural periodicals as the second most influential among the early means of agricultural education. This reviewer is not convinced that farmers read the periodicals to which they subscribed, or, if they did, that they practised its precepts. Professor Scott himself adds a rather damning doubt to his original view. Though he cites the findings of a survey that 40 per cent of farmers interviewed by the United States Department of Agriculture in 1926 considered farm journals to be their most valuable source of information, he also quotes the view of one writer that farm editors followed rather than led the process of change in the countryside.

The land-grant college system inaugurated in 1862, did not immediately have a startling success. For 20 years, according to Scott, little advance was made in scientific knowledge by these institutions. The author attributes this slow start to the availability of free and fertile land which made scientific farming seem unnecessary. In any case, the progress of agricultural science in the colleges and universities was hampered by the fact that its pursuit tended to be scorned by university classical scholars, while farmers, on the other hand, doubted its practical relevance. Gradually, however, the colleges and universities began to do some valuable scientific work, and this sort of achievement was given an important boost with the passage of the Hatch Act in 1887, which provided federal funds for the establishment of experiment stations, predominantly within the agricultural colleges and universities.

The concomitant problem of communicating new knowledge to farmers was more intractable than that of achieving progress in agricultural science. The land-grant colleges early began to make efforts to provide extension services to farmers, and so did numerous other agencies as well, though the term "extension service" was not necessarily used. Among the other agencies which undertook such work were farmers' institutes, farm organizations such as the Grange, farm periodicals, Federal and State Departments of Agriculture, and private agencies both business and philanthropic.

Professor Scott sees farmers' institutes and farm organizations, such as the Grange, as having had an important influence in the latter part of the nineteenth century in breaking the wall of farmer "antipathy and apathy". (Such apathy toward increasing productivity is not surprising in view of the fact that this was also a period of declining prices.) The farmers' institutes were usually schools lasting 2 or 3 days for adult farmers, and these schools were usually, though not always, run by land-grant colleges or experiment stations. The institutes were found to be inadequate, as the need to take agricultural education direct to the individual farmers became clear, and by 1913 they had become obsolete. They were transitional methods, though the related method of the "short courses" continued to have value.

Agricultural education in the transitional period also had support from private agencies, notably the railroads, to whom an increase in crop yields meant additional goods to be hauled, farm equipment companies, such as International Harvester, and some banks and fertilizer companies.

These private agencies were at least partially self-interested. The land-grant colleges and universities were placed in a dilemma by this sort of support, for while they needed the funds from these sources, they did not wish to appear allies of businesses to which the farmers were often hostile. More purely philanthropic and also more significant was the support given by John D. Rockefeller's foundation, the General Education Board, established in 1903. The aim of this foundation, as its name implies, was to improve general education (in the South). The link with agriculture came though the reasoning that the main difficulty with southern education stemmed from poverty. Therefore the best means of improving general education would be by improving southern farming. The General Education Board became an important source of funds, before 1914, for broadening the extension work which had already been undertaken by the United States Department of Agriculture.

The U.S.D.A., through the work of a special agent in the South, Seaman A. Knapp, had undertaken a seminal but narrowly focused programme of extension education. Knapp defined his task as a campaign to help Southern farmers to deal with what seemed to him their most crucial problem—the devastation which threatened the cotton crop when the Mexican boll weevil crossed the Rio Grande into Texas in 1892 and thereafter spread inexorably into other regions. According to Professor Scott, scientists believed the boll weevil to be the most dangerous pest ever to attack a crop in the United States.

Since various insecticides proved futile, and the development of weevil-resistant varieties of cotton appeared impossible, the best hope was thought to lie in improved methods of growing the crop, especially in early planting. Knapp carried the gospel of improved techniques to farmers with an evangelical fervour, but also with a sound and sober method which he chiefly pioneered—that of demonstration. According to Scott, the demonstration plots, raised by practising farmers in co-operation with the U.S.D.A., did more than anything else to convert the neighbouring “reluctant farmers” to the value of scientific agriculture.

Knapp himself was rather hostile to the scientific intellectuals of the land-grant colleges, and even came into some conflict with the Bureau of Entomology of the U.S.D.A., which had worked on the life-cycle of the boll weevil. The men of the State agricultural colleges were jealous of Knapp's programme, since it was purely a Federal project. One Federal agency, the Bureau of Entomology of the U.S.D.A., was jealous of another Federal agency, the Bureau of Extension, which controlled the work of Knapp and his boll weevil campaign. Knapp replied that the Bureau of Entomology had done nothing to spread knowledge to farmers except issue bulletins, and that something more than this was necessary to induce most farmers to change their practices. Knapp remained in charge of the boll weevil control programme, which was the original core of the demonstration work. Through Rockefeller Foundation support, demonstration work was broadened to include improved farm practices in other crops and types of farming, and finally to include home demonstration work among farm women in such matters as family nutrition.



In the meantime the States were becoming increasingly active in demonstration work. By 1913, the funds appropriated by states and counties were almost as large as the Federal appropriation and were almost double the annual contribution of Rockefeller's General Education Board. The need for a central office in each state through which the programme could be administered was apparent, and the logical choice was the land-grant college, which was already carrying out an extension programme itself.

Eventually Knapp made an effort to work with the men from the State land-grant colleges and universities, for it was becoming increasingly clear that it was here that the main progress in agricultural science was being made. It was not until after Knapp's death in 1911, however, that the first agreement about extension was made between the U.S.D.A. and a State land-grant college. This first agreement, in 1912, provided that all demonstration in South Carolina would be administered through the State Land-Grant College, Clemson. Several such agreements were made with other States before the passage of the Smith-Lever Act.

Two key features which had already been developed were incorporated into the Extension Service set up by the Smith-Lever Act of 1914. One was the method of demonstration growing out of the work of Knapp. The other was the county-agent system, by which an agent of the Extension Service in each co-operating county was responsible for carrying agricultural education direct to the farmers in that county. The evolution of this system has been well told already in Gladys Baker's book, *The County Agent* (Chicago, 1939). Professor Scott's account is sketchy in comparison, but is necessary to round out the scope of his book.

The dominant figure in the rise of the county agent system in the northern and western States was William J. Spillman. Like Knapp, Spillman was an employee of the U.S.D.A., but he was much more willing than Knapp had been to co-operate with the State land-grant colleges and universities. He also encouraged counties to make appropriations to help pay a share of country agents' salaries. In this general scheme, farmers were encouraged to form local farm organizations to support the work of the county agents of the extension services.

It was just prior to this time, but in the same general context that the mighty American Farm Bureau Federation had its humble beginnings in a local farm bureau in up-State New York in 1911. Scott briefly mentions the Farm Bureau in its educational role, but does not analyze how its primary role shifted in time from that of an educational agency to that of a political policy-making and pressure group. Scott's account is fair enough, for this relative change in functions had not taken place before 1914, and therefore is outside the scope of this book.

The main achievement of the Smith-Lever Act was to define and expand a Federal-State Co-operative Extension Service, the main features of which had already come into existence. It provided that the agency for administering agricultural extension within each State should be the land-grant college or university, and that any project financed by Federal funds should be mutually agreed upon by these academic institutions and the U.S.D.A. After the passage of this act, private philanthropic agencies which had played an important role in inaugurating agricultural extension ceased to be significant in this work.

The most striking impression left by Professor Scott's book is that the notable success, eventually, of the programme of agricultural education through the extension services may be explained by the variety and flexibility of the institutional structure. Even the land-grant colleges do not conform to any one rigid pattern. In some states they were made part of old established private universities, like Cornell in New York State, while in other states the college was incorporated into an already existing state university. Yet another variation was the establishment of separate State agricultural colleges under the Morrill Act. The number and variety of agencies that played, and still play, a role in agricultural extension undoubtedly have given strength and vitality to the effort to communicate the findings of agricultural science to farmers.

The reviewer has one small quibble with Professor Scott's book—or rather with its title. The implication, that the original “reluctance” of most farmers stemmed from a stubborn and irrational resistance to scientific farming, needs to be modified by the recognition that many farmers, quite rationally, viewed well-meant efforts to increase productivity as futile unless they were convinced that the benefits of the new practices would outweigh the costs.

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