BOOK REVIEWS

The State and the Farmer. By P. Self and H. J. Storing. (London: Allen and Unwin, 1962.) Pp. 251, 30/- stg.

Britain is not the only modern State in which agriculture has become highly dependent upon public support. But the remarkable thing about the partnership between Agriculture and the State in post-war Britain is the fact that agriculture employs only four percent of the working population, and produces about the same proportion of national output.

Self and Storing present a well integrated history of this partnership between the State and British Agriculture. The central character is quite naturally the National Farmers' Union, and the development of this organization in response to the dynamic conditions of post-war Britain makes fascinating reading.

The statutory foundation for the partnership was the Agriculture Act of 1947, with its twin pillars of stability and efficiency—stability through the annual price review; efficiency through technical assistance and, in the last resort, power to require the farmer to vacate his farm. These coercive powers were an extension of war-time controls, and their peace-time acceptance seems remarkable to one who has had some dealings with Australian farming groups. Although supported throughout by the National Farmers' Union as a necessary and reasonable quid pro quo for the annual price review, sanctions nevertheless had a stormy history and were repealed in the 1957 Act. Self and Storing generally support "the birch in the cupboard" and the chapter on this subject is an excellent psychological study.

It is clear that the continued success of the N.F.U. has been largely achieved through the compulsion felt by successive Governments to woo the farmers' vote. The N.F.U., with shrewd leadership, depended up to 1957 on its consultative status to gain its ends, and carefully kept its supposedly big stick out of sight. Its leaders consistently acted on the belief that "the prosperity of agriculture depended almost entirely upon Government action, and that their own activities were best directed towards influencing that action. While they always paid lip service to the principle of self-help, it did not occupy a prominent place in their thinking".

The Agriculture Act of 1957 introduced adumbrations of the changing nature of the partnership. This gave the farmers greater legal rights in the annual price review, and as a subtle form of compensation, the Government has felt itself freer to adopt a firmer position. A gentleman's agreement can oftentimes bind partners much more closely than a formal agreement. It seems evident that the Government gained a tactical victory in 1957 by replacing consultation with negotiation. They had at last decided—as the N.F.U. had always known—that the big stick was not so big after all!

One feels also that this was probably a necessary prerequisite to the initiation of moves for European integration. This subject, however, is not discussed by Self and Storing, whose book went to press in May, 1961. This reviewer at least hopes that these gentlemen will find time in the future to bring their study up to date.

Significantly, as Whitehall cooled in its attitude, the N.F.U. started to shift its objectives and is taking for the first time an interest in marketing and farm management problems. The authors warn that "the Union's

future course will depend upon how well it has learned the lesson that leadership of the agricultural industry requires more than hard political bargaining for a share of the public purse".

This is an attractively written book which is as easy to read as a novel. It is at the same time, a penetrative case-study of how pressure groups influence public policy in a modern State. Students of political science, and those concerned with agricultural marketing and policy-making will find much to interest them in this well-documented book.

E. O. BURNS *Department of Agriculture and Stock, Brisbane.*

The Economics of Subsidizing Agriculture. BY G. MCCRONE. (London: Allen and Unwin, 1962.) Pp. 189, 25/- stg.

Mr. McCrone starts off by pointing out how small a part is played in the British economy by agriculture—only 4·1 per cent of the working population is employed in agriculture and they receive 4·2 per cent of the G.N.P. The very smallness of the agricultural sector means they have been able to use the system of deficiency payments for subsidizing their agriculture. This would have been impossible had agriculture loomed larger in the economy, as it does in West Germany where 17 per cent of the work force is in agriculture and receives 7 per cent of the G.N.P. The corresponding figures for Australia are 16 and 25 per cent, and for New Zealand 18 and 30 per cent.

McCrone measures the cost of subsidizing British agriculture. For 1960-61 the cost to the Exchequer was £150·5m in price guarantees, £103·4m in production grants, £7·9m in improvement grants and £10·4m in research and advisory expenses, with a total cost to the tax payer of £264·3m. It is interesting to see that production grants such as fertilizer and calf subsidies, which tend to help farmers to become more efficient and so more competitive, are increasing while price guarantees, which often reach the wrong farmers in the wrong way, are decreasing, though not rapidly.

But in addition to this £264·3m from the Exchequer, the British farmer received in 1960-61 an estimated £85m from the activities of the various marketing boards which are able to charge higher than world prices for milk, potatoes, etc. The total support from Exchequer and consumer in 1960-61 came to about £350m.

This astronomical figure is then compared to the support received by agriculture in the other Western European countries. The results are most interesting, as shown in the following table where it can be seen

	A Agricultural output at national prices £m.	B Support £m.	B/A per cent	Support per head of agric. population £	Support per head of total population £
France	2481·9	380·6	15	69	8·2
Italy	1801·4	254·3	14	31	5·3
West Germany	1565·5	273·9	18	53	5·1
United Kingdom	1298·2	308·3	24	251	6·3
Netherlands	439·7	21·1	5	28	1·9
Denmark	368·3	9·7	3	19	2·2
Belgium and Luxemburg	319·8	17·1	5	41	1·9

that the amount of assistance per head of the agricultural population varies from £251 in the United Kingdom to £19 in Denmark.

McCrone then examines the reasons usually advanced to justify this generous treatment and finds that in the case of both the 'Balance of Payments' and the 'Terms of Trade' arguments, the policy of subsidy is not justified.

To an Australian, in this day and age, it seems queer that the next section of the book is devoted to an examination of the question as to whether food could be obtained from elsewhere if Britain decided to grow less food. But we should remember that this question loomed large as a justification for British policy after the War. He examines the population explosion and concludes that the world in general is at present on the ascending portion of the 'S' curve, and that the problem in general will become more serious and then, later, improve, as indeed it has done in developed countries.

His main conclusion is that there are no economic reasons to justify the present massive support to British agriculture, although there may be social and strategic reasons, though he is sceptical of these also.

I found the book challenging and interesting. My chief complaint is that I have yet to find a similar examination of the economics of subsidizing industry in Australia.

C. R. KELLY *Member for Wakefield, House of Representatives, Canberra.*

Variance and Production Function Analyses of Farm Accounts. BY K. RASMUSSEN. (Oxford: Basil Blackwell, 1962.) Pp. 150, 21/- stg.

Production Function Analyses of British and Irish Farm Accounts. BY K. RASMUSSEN WITH M. M. SANDILANDS. (Loughborough: University of Nottingham, Department of Agricultural Economics, 1962.) Pp. viii + 116, 17/6 stg.

Recent mistrust of estimates of the production function from non-experimental cross-section data have arisen largely from problems of adequate specification, the aggregation of variables, and the inter-relationship between regressor variables. Yet Rasmussen, in his studies of Danish, British and Irish farm accounts, dismisses these problems and addresses himself to two related questions of interpretation which were raised in the early years of the application of this technique. The first is whether estimates derived from single-year accounts are an adequate basis for recommending changes of resource use within farms. The second relates to the dynamic usefulness of the static cross-section estimates—are the single period estimates satisfactory for making decisions over time?

To answer these questions, analyses have been performed on the accounts of large samples of farms which are available for several years (5 years for Danish farms, 4 for British, and 3 for Irish). Using an analysis of covariance technique Rasmussen derives *within-year* and *between-farm* functions, which are essentially inter-farm functions, and a *residual* function which should estimate intra-farm response. The latter function is rejected, however, due to substantial error elements which are present in the variance components used.

Rasmussen categorizes the disturbance term of any function into two components. The first is a *random* effect which is due to such factors as climate and temperature, difficulties of recording and valuation, variation

in timeliness of cultivations, variation in farming programmes from year to year, etc. This component varies from year to year within each farm. The second is a *management* effect which arises from decisions about the composition and supplementation of inputs and the crop and livestock programme adopted. This component does not vary from year to year within each farm. These sources of deviation are identifiable as components of variance. Random and management components generally provide similar contributions to the between farm residual variances in analyses based on single year accounts. As the number of years over which accounts are pooled increases, the relative importance of the random component declines.

Single year accounts hence give a poor indication of management variation other than with respect to global input decisions. The analyses suggest, however, that functions computed from single year data may give a good indication of the consequences of a deliberate change made in a farming unit. Rasmussen estimates a function based solely on the *management* component of variance to represent such a structural relationship, and this function is closely resembled by both *within-years* and *between-farm* functions.

Little is made of estimating optimum input levels. Rasmussen rather discusses the expansion path of least cost combinations of inputs at given returns on capital. (A return of 3 per cent on capital seems to keep capital values relatively stable in Danish agriculture).

Major interest of the studies comes from the discussions of the relative importance of *allocation of resources* and *managerial variation* in accounting for differences in farming efficiency. For this purpose the variance of the ratio of gross product to total costs averaged over time is broken down into recognizable components. In all cases (Danish, British and Irish) scale of farming and combination of inputs at a given scale of farming account for a relatively small proportion of total efficiency variation (11 per cent in Denmark). Managerial variance at a given combination of inputs, on the other hand, accounts for a relatively large proportion of total efficiency variation (72 per cent in Denmark). Rasmussen hence concludes that "advice given to farmers which is based upon calculated marginal productivities will only touch the fringe of management problems." The major problem is management at given global inputs, involving choice of products and detailed selection and use of inputs from day to day.

Presumably, then, the *what, when* and *how* questions provide a much greater stumbling block to farmers than the questions of *how much.*

Let farm management analysts take note! But we might well make three criticisms, none of which is really spoken to by Rasmussen. The first is whether the components of variance are as correctly categorized as Rasmussen would suggest. Management is conceived of as being highly static, remaining constant throughout the period. The products and technology which characterize the average period are said to be management components, whereas changes in what is produced and how it is produced are random components. This is quite contrary to our views of the role of astute management. Furthermore one would think that a consistent output above or below the average regression line (considered by Rasmussen to be due to better or worse than average management) might also be a result of a location effect, particularly given the wide regional distribution of farms in the samples.

The second criticism is more general. At what level of aggregation do the *what, when,* and *how* questions cease to be questions of *how much?* Global input levels may account for relatively little variation of efficiency because highly aggregated inputs cover up too much. Highly aggregated analyses should not be used as the major basis for within-farm advice. One would expect however, that as the population and sample is reduced to the district level, and inputs chosen are more easily manipulative, the proportion of efficiency variance accounted for by input levels will increase.

The third criticism is concerned with the ratio of gross product to total cost as an indicator of production efficiency, and the analysis of its variance to indicate the relative importance of components of this ratio. Certainly the ratio will reflect comparative long run efficiency at a given level of expenditure. But asset fixity must be taken seriously, since it is in the context of a distribution of fixed assets between farms that "advice" is given. In this situation the gross product to total cost ratio fails to be a useful criterion for evaluating relative efficiency in the short-run. Also all farmers in a region may be over or under spending on whole categories of resources. The analysis of variance technique analyses observed deviations and not deviations from an a priori optimum.

These studies are imaginatively conceived and are presented with commendable thoroughness and parsimony. Replication through time and between countries is their greatest merit. Agricultural economists are frequently critical of agronomists for their inadequate conception of response experiments, but have much to learn from them with respect to replication and avoidance of confounding of differences which are of interest. Rasmussen's work is a most useful break from the first of these deficiencies, but the reviewer feels that the second may not be as clearly resolved as Rasmussen suggests.

R. G. MAULDON

Institute of Agriculture,
University of Western Australia, Perth.

Agricultural Policy under Economic Development. By E. O. HEADY. (Ames: Iowa State University Press, 1962.) Pp. ix + 682, $10.50.

In his preface Professor Heady tells us that this book was written "to fill a void; namely, the lack of a book on [agricultural] policy which combines a fair amount of theory and analytical treatment with the more descriptive and literary analysis of agricultural structure and policy". A decade earlier Heady wrote an extremely successful and influential book on agricultural production economics which has many similarities with the present volume. Both set out to discuss their subject in the framework of the relevant economic theory; both are encyclopedic and both tend to be verbose. There are some minor differences—in 1952 "all discussion which includes algebra or calculus has been relegated to footnotes". Ten years later both calculus and algebra appear in the text, but with an apologetic note in the preface that "while it does include some equations and graphs and a frequent focus on technical terminology, it also has a major content in purely literary manner".

In this reviewer's opinion, Heady's treatment of agricultural policy in this book is not as successful as his earlier treatment of production economics. This is not necessarily Heady's fault; the theory of produc-

tion economics provides a stronger scaffold for empirical flesh than any analytical framework available for the study of agricultural policy. Heady's 1952 book confined itself to the high road of traditional analysis whilst this volume contains in addition what T. W. Schultz has called "the low road of policy, full of opinions, beliefs and values and hot with controversy".

According to Heady the main policy issue for commercial agricultural in the U.S. in the forseeable future is: how can agriculture contribute to national economic growth and still realise an equitable share of the gains stemming from this growth? It is suggested that agriculture does not realize such an equitable share. Firstly, because the competitive structure of agriculture ensures the passing on of the benefits of increased productivity in the agricultural sector to all consumers in the economy; and, secondly, because the demand and income elasticities for the products of agriculture as a whole are below unity. These inelasticities imply that the gross and net revenues accruing to farmers as a whole will be lower after the introduction of a technical improvement in agriculture than before.

The income problems of commercial farmers—it is suggested—can be dealt with in three ways, namely (i) shifting the demand function to the right; (ii) shifting the supply function to the left; or (iii) increasing the elasticity of the supply function. In common with most agricultural economists, Heady sees little scope for shifting the U.S. demand function for food to the right. "Hence major adjustment apparently must come from the direction of supply and quantity of inputs committed to particular commodities, lessening inputs and outputs so that returns are increased" (p. 253). Like most U.S. writers, Heady discusses demand almost entirely in terms of internal U.S. consumption—although at another point (p. 626) he admits that the development of foreign markets provides "the single major opportunity" for increasing farm incomes.

Heady argues that society in the U.S. is searching for methods of compensating U.S. farmers for their inequitable share in economic growth. This inequity has been aggravagated by the creation of public institutions which accelerate technical progress in agriculture and thus affect farm incomes adversely. The compensation methods used since 1930 are unsatisfactory because they have caused too many resources to be used for food production; furthermore they have encouraged the wrong farm product mix to be produced, with too many resources allocated to grains and cotton.

As an alternative to support prices Heady suggests either direct payments (not tied to units of output or input used in future periods) and/or marketing quotas. Direct payments are "the least-cost method for society" but not necessarily the cheapest in terms of treasury outlays. Treasury outlays would be minimized by effective supply control; here the emphasis is on "effective"—in contrast to the currently practised acreage controls which do not in fact reduce aggregate farm output significantly.

But price supports and/or supply controls will never provide a permanent solution to the lag of farm income below non-farm income, because any short-run income gains achieved become capitalized in land or other non-human resources. The basic cause of the income disparity is therefore the low short-run supply elasticity of factors engaged in agriculture. "In the regime of low supply elasticities, two factors are most

important: land and labour . . . Low supply elasticity for land has its more notable effect in causing a low income blanket to lie over all of agriculture. Low elasticity and mobility for labor cause particular individuals and strata of the farm population to suffer extreme income depression" (p. 447). Heady suggests that policy should aim at encouraging shifts in land supply to those uses where income elasticities are relatively high (e.g. recreation, forestry, grazing). The required movement of labour out of U.S. agriculture to give farmers equal income opportunities with non-farm workers is large indeed. According to one USDA estimate 250,000 farm youths will be entering the labour force annually during the sixties, but there will be farm employment opportunities for only 25,000 on farms producing a gross value of sales of $2,500 a year or more. $2,500 gross sales is consistent with net incomes of about $1,500 or less—a meagre standard considering general U.S. income levels. It is argued therefore that in many U.S. farming districts relatively too much is invested in vocational agricultural training whilst training for the large proportion of farm-reared youths who will eventually leave agriculture is inadequate. In addition, farm youths generally obtain less schooling than the average and are thus at a disadvantage in urban labour markets. Other suggestions made for increasing the mobility of the farm labour force are termination payments for those leaving agriculture (such as are customary in the armed services), transportation subsidies and improved employment services.

There will be widespread agreement among agricultural economists with parts of Heady's diagnosis and prescription, even though his central thesis that agriculture does not share equitably in economic growth is more controversial. Of course, this depends partly on what we mean by "sharing equitably"; one man's notion of equitable shares is notoriously different from the next man's—especially if one is a producer of a product and the other a purchaser (or one an employer and the other an employee). Heady's standard of equity is that incomes per head in agriculture lag behind incomes per head in other sectors and that, as incomes increase, the absolute differential has grown wider. This is, of course, only one possible view of "sharing equitably". Another one might be whether average per capita incomes of any group advance at the same rate as that of the economy as a whole. Using this criterion D. Gale Johnson has pointed to a definite body of evidence, "drawn from the experience of several nations, that farm people have shared fully in the long-run growth in per capita real income in the developed countries. In other words the functioning of markets, primarily factor markets, has been such as to result in real income increases for farm people of the same order of magnitude as is enjoyed by persons in the rest of the economy. Thus despite the low income elasticity of demand for farm products, the rapid adoption of technological change, the low price elasticity of demand and the higher birthrate in rural areas than in urban areas, farm people have enjoyed the fruits of economic growth".[1]

There is little dispute about the facts. Heady cities (Table 3·5) the evidence assembled by Kuznets and others on the changes in the ratio of agricultural income per worker to income per non-agricultural worker for selected countries and periods. He points out that "the data show no formal pattern. They do not increase or decline consistently over time,

[1] Johnson, D. G. "The shifting fortunes of agriculture". *Proc. Tenth International Conference of Agricultural Economists,* Oxford Univ. Press, 1960, p. 35.

even with depression periods excluded. *If there is any tendency in these and other data, it is for the ratio to increase with time*" (p. 101—my italics). Heady would also argue that even if the somewhat uncertain long-term improvement of the ratio (of per capita farm to non-farm incomes) continues, it would take over a century for the ratio to equal unity. This is too slow—in any case the short-run trend (i.e. since 1950) has been for the ratio to decline. Might this forecast a change of the long-term trend? Heady does not go so far, but the possibility cannot be dismissed in view of the evidence of an acceleration in the long-run of productivity increase in U.S. agriculture.

The above is a bare outline and discussion of the central thesis of Heady's work. It cannot do justice to the wealth of detail—both descriptive and analytic—in a work of 682 pages.

F. H. GRUEN *Australian National University, Canberra.*

Investment for Food. BY D. GROENVELD. (Amsterdam: North-Holland Publishing Company, 1961.) Pp. 146, 27/- stg.

Since the end of the Second World War the rapid growth in world population has led to considerable discussion of how agricultural output could be expanded to keep pace with the ever increasing demand for food. One of the most recent contributions to this problem is this book by Groenveld, an agricultural economist in the International Bank for Reconstruction and Development.

As the title of the book suggests, Groenveld is primarily concerned with the economic side of the problem, namely, the amount of capital required to be invested in agriculture during the period 1960-1980 to ensure an adequate expansion in the supply of food. The analysis is restricted to Africa, Asia and Latin America, as Groenveld argues that "these will be the three critical areas with respect to the expansion of food production. In Europe, Australia and North America there are to the contrary already 'surpluses' and production will increase on these continents sufficiently." (p. 7).

The book is relatively short (101 pages of text plus 41 pages of tables) and can be divided into two parts. The first section, which comprises chapters 1-6, is an elementary survey of trends in population growth and food production. Groenveld's main aim here is to indicate the urgent task facing the underdeveloped regions in the next two decades in increasing their output of food.

The second section (chapters 7-12) is much more satisfactory. After taking into account the likely increase in population and per capita consumption of foodstuffs, Groenveld estimates that between 1960 and 1980 it will be necessary to raise food production in Africa by 50 per cent, in Asia by 60 per cent and in Latin America by 70 per cent. Groenveld then goes on to consider how the required increase in food production can be achieved. For the three main groups of crops—cereals, roots and pulses—it is assumed that yields will improve by roughly 20-30 per cent. On this basis he estimates that it will be necessary for the underdeveloped regions to extend their farm area by 118 million hectares. His final step is to estimate the investment required to bring about the assumed improvements in yield and the assumed expansion in farm area. This is arrived at after detailed examination of national accounts,

development plans and specific projects, and constitutes one of the most interesting parts of the book. For the period under review it is estimated that the underdeveloped regions will have to invest a total of 138 billion dollars in agriculture. Of this, 86 billion dollars will have to be spent in raising yields and 52 billion dollars in expanding the farm area.

Although written in a clear and logical fashion, *Investment for Food* is marred by several faults. In the first place Groenveld tends to make excessive use of quotations and references. This is especially noticeable in the earlier chapters of the book. Secondly, and more important, is the author's failure to treat the problem adequately. After reading through the book one is left with the impression that it stops short and that some attempt should have been made to consider how the underdeveloped regions might be able to finance the investment programme. This is a serious fault and seems to have been recognized by the author in the final chapter where he states that "the study raises more questions than it answers." (p. 97).

Despite these deficiencies *Investment for Food* is a timely work and at least focuses attention on the immediate task confronting the underdeveloped regions in the next two decades in expanding their output of food.

G. R. WEBB *University of Melbourne.*

The Simple Fleece. EDITED BY ALAN BARNARD. (Melbourne: Melbourne University Press, 1962.) Pp. xv + 640, 63/-.

This book comprises a collection of some forty papers presented to a seminar on the Australian wool industry held at the Australian National University during the period 1957 to 1960. The papers cover technical aspects of sheep production and wool technology as well as selected aspects of the history, economics and politics of this most important of Australian industries.

Those who are at all closely in touch with the wool industry will find little in the book that is new. The vast majority of the material has already been published in other places, some of it in the actual form in which it appears in this book. Nevertheless a useful purpose has been served by bringing such a wide spectrum of information about the wool industry between two covers.

To judge from Sir Keith Hancock's foreword, the seminar was originally conceived as an experiment in interdisciplinary communication. Different readers will doubtless form different impressions as to how successful the book is in this respect. Valuable as interdisciplinary discussions are, there would seem to be definite limits beyond which excursions into other disciplines cease to contribute much to one's understanding. The historian or the economist who wishes to understand the intricacies of wool production does not really have to study the histological structure of the wool fibre or the anatomical arrangements whereby the intratesticular temperature of rams is controlled. Likewise, the physiologist is not greatly assisted in his work by a knowledge of the political activities of graziers in the N.S.W. Parliament in the 1880's. Though the editor recommends that the book be read as a whole, and though the reviewer faithfully followed that advice, he would hesitate to offer the same prescription to others.

N. G. Butlin's contributions are among the most original in the book,

although Chapter 26, which was written in cooperation with Barnard, does not fully cover the period promised by its title. Butlin appears to be altogether too ready to apply the term "speculative" to the periods of pastoral expansion, at least judging on the evidence provided. Geoffrey Sawer's essay on "Rabbits, the Law and the Constitution" is an interesting survey of the legal difficulties associated with the regulatory activities of governments.

The publishers and the editor have done a good job of presenting material from many diverse disciplines. There are remarkably few typographical errors. Some of the authors, on the other hand, have not really tried to present their material in a straightforward way, with a minimum of jargon. Some of the chapters are unnecessarily long and tedious.

Reading a book of the scope of the one under review, one cannot but be struck by the contrast between the depth, the detail and the assurance characterizing the writings of the biologists and the incompleteness and tentativeness found in most of the writings of the social scientists. This contrast remains even if one makes allowance for the differing nature of the disciplines involved. The great gaps in knowledge in the social science side are patently obvious. Many of the historical and political contributions, in particular, are marred for purposes of a general survey of the industry by being too circumscribed with respect to both time and geographical area. From the standpoint of the social sciences, it therefore seems wrong to describe this book (as the patter on the dust jacket does) as a "complete and penetrating study of the wool industry". The book is rather a testimony to the disproportionate share of resources devoted to research into the physical and biological aspects of the wool industry.

KEITH O. CAMPBELL *University of Sydney.*

Farm Business Management: The Decision Making Process. BY E. N. CASTLE AND M. M. BECKER. (New York: Macmillan, 1962.) Pp. xvi + 423, 65/6.

This is another first text in farm management, and one which is very succesful in both form and content. What mental constructs does the student need to acquire to solve problems in farm management? Castle and Becker suggest that he needs knowledge of budgeting and economic principles. Given this, he can presumably collect and organize information about the farm and its farmer and operate on that information to derive a course of action which is a best approximation of that unknown course which would be most successful in achieving the farmer's goals. There must always be qualms in a farm management adviser's mind that he could have given better advice; farm management is an pplied science which is never subjected to definite tests of its efficacy. Even the most elaborately formulated model is only a partial description of the possible and actual cause-effect relationships on a particular farm. So, in addition to constructs and collected information our adviser will need judgment.

It is within such a framework that Castle and Becker have planned their book. Part One deals with the decision making process in general terms. Part Two describes farm records and the tools of decision making, economic principles and budgeting. Part Three discusses the

acquisition of capital and land, and has a chapter on the selection and combination of enterprises.

This latter is perhaps one of the few inadequate chapters in the book. Briefly, the author's method is as follows: Select from the possible enterprises the one that is believed (sic) to have the highest gross margin. Expand this as far as resources permit, and concurrently, expand any supplementary or complementary enterprises up to the onset of competition. Now, expand the next most profitable enterprise if it adds to income: "If it does add to income it may completely replace the original enterprise." A few sentences later they say "Various combinations can be tried until the planner is satisfied that the most profitable combination of enterprises has been determined." The reviewer's impression is that attempting to follow the instructions given could end in making large numbers of unsystematic calculations. Surely it would be better to: (i) define the limiting size and gross margin of each enterprise singly; (ii) introduce the most profitable enterprise up to its limit and redefine the limiting size and gross margin of other enterprises; (iii) introduce the most profitable "other" enterprise up to its limit. This process can be repeated till a "full capacity" plan is obtained. Then (iv) given a full capacity plan, define physical substitution rates and hence profit substitution rates between enterprises; (v) substitute the most profitable enterprise for the least profitable enterprise at the margin; and (vi) repeat steps (iv) and (v). Such a procedure would allow full use to be made of subjective knowledge about production possibilities and each plan would move a step nearer the optimum.

Part Four, "Managing the Organized Farm", devotes chapters to single facets of the managerial function—crops, soils, stock, labour, machinery, etc. Whilst the American background limits the usefulness of these chapters in Australia (there is nothing about pasture management), they nevertheless communicate the attitude required to think effectively and develop judgment about these problems. A chapter on taxation management points the paucity of work in this field in Australian agricultural economics.

Part Five consists of one chapter which discusses farming and farm management in a dynamic society.

Castle and Becker have written a book which is probably good enough to replace current University texts, but the feeling lingers that farm management still awaits the coming of the author who will subsume the tools of farm management into a scheme where all farm management decisions are seen as variants of a single problem or range of problems.

DOUGLAS COCKS *Department of Agriculture, Melbourne.*

Design of Water-Resource Systems: New Techniques for Relating Economic Objectives, Engineering Analysis, and Government Planning. BY A. MAAS *et al.* (London: Macmillan, 1962.) Pp. xviii + 620, £6/16/-.

This excellent book is the product of the Harvard Water Program, which was inaugurated in 1955 and conducted until 1960 by a formidable selection of economists, engineers, agriculturalists, and administrators under the direction of Arthur Maas, the Professor of Government.

Over forty participated in the programme, the economists of note being Professors Robert Dorfman and Otto Eckstein, and Stephen A. Marglin. The only others responsible for key chapters and likely to be familiar to readers of this *Journal* are Harold A. Thomas, Jnr., the Professor of Engineering, and Maynard M. Hufschmidt, a Research Associate in Pubilc Administration.

The purpose is evident in the title, "to improve the methodology of designing water-resource systems". The first step is Marglin's chapter on the "objectives of water-resource development". He selects economic efficiency and income redistribution as the most important means by which systems can contribute to the primary objective of national welfare. His problem is then to find functions for ranking the entire set of alternative designs of a system according to the degree to which they satisfy these means, or secondary objectives. His choice is the "aggregate net willingness to pay of all those affected by a particular design" which is the willingness to pay for the output less the money value of goods foregone to construct and operate the design. This function only meets necessary requirements under perfect competition and where there are constant marginal utilities of income. The willingness to pay for the output is obtained by integrating the aggregate demand function.

This approach is expanded to deal with the multipurpose, multiperiod case, and first derivatives of the Lagrangian form of the resulting ranking function and the associated production function are set equal to zero to find the marginal conditions of maximization. Similar operations are then performed under budgetary constraints with all construction in the initial period. All this is everyday economics.

Marglin then deals with "external effects" and other side-issues in a workmanlike fashion and presents a very worthwhile solution of the problem of "income redistribution through system design". His whole chapter is a pleasingly concise statement about ranking functions and criteria that puts to shame a lot of earlier work and may be recommended as a standard for journal editors (ours excluded) too prone to admit vague articles on these subjects.

Dorfman's chapter on "basic economic and technologic concepts" is equally meticulous. It is obviously intended for the reader who is not versed in economics and proves a little tedious for the economist condemned to read the book from the first to the sixth-hundredth page. Its justification doubtless lies in the necessity to shake order into the confusion and muddle in water-resource planning. Dorfman explains the production function, the net benefit function, the conditions for optimization (three concepts already used by Marglin!), discounting, and the effect on these of prices being a function of quantities instead of constant.

In dealing with uncertainty, Dorfman outlines the principles of maximum returns and minimax risks, the probabilistic approach, the expected-value approach, and other even less useful concepts. He finally recommends Thomas's idea of an equalization fund established along with the system and used for making up the differences between actual and expected benefits. The fund earns interest, and its size may be shown to be proportional to the standard deviation of the distribution of outcomes in a single year. There is no acknowledgement, and one can only assume that the resulting simple and useful formula for net benefits in the presence of uncertainty is published here for the first time.

Marglin returns in Chapter 4 with "economic factors affecting system

design". He adapts the expressions derived in the preceding chapters to allow for budgetary constraints of various kinds. He then discusses the problems of determining the sequence in which projects should be undertaken with a limited budget and of allocating shadow prices to future supplies. He concludes with a discussion of the influence on time-preferences and interest rates of alternative avenues of investment within a multisector economy. His discussion draws heavily on Baumol and on Sen and is largely a critical review, although he again makes valuable comment on the relationship of alternative investments to the redistribution of income.

Hufschmidt's Chapter 5 graphically solves a simple problem generated by the basic sorts of relationships provided in earlier chapters. This is a preliminary to Part II of the book, which deals with methods applicable to multiunit, multipurpose systems.

In order to test the "conventional" and "proposed" methods, an artificial river basin is devised. Among its important characteristics are: numerous possible scales of development; possibilities for irrigation, water power, and reduction of flood damage; streamflows with flood peaks and with troughs so low as to require annual storage; and numerous sites for reservoirs. This system is complex enough for a satisfactory exercise but the authors admit to excluding variable water quality, and industrial, urban and recreational uses of water. Also, a "unit gross irrigation benefit function" and a "water-shortage: irrigation-loss function" are assumed, to obviate the difficult task of assessing the benefits from farming. Farming costs appear to be excluded, no doubt due to the preoccupation with constraints on public finance. One hopes that the hypothetical farmers would make a living and that the marginal return to credit extended to them would equal the marginal return on the storage system.

After the system has been completely specified in Chapter 7, "conventional" methods of analysis are applied by three groups of representatives of public agencies. They formulate a tentative plan and modify it by incremental analysis, using hand computers. The present value of net benefits in their best plan is 674 million dollars for the 50 year period.

Chapter 9 sets out the simulation of the system for an IBM704, using the well known FORTRAN II automatic coding technique, and all the relationships and flow charts for moving towards an optimum by a stepwise method are tabulated. Chapter 10, by Hufschmidt, sets out the exploration of the thirteen dimensional "net benefit response surface" by means of the computer programme. The dimensions are given by the number of variable components in the design, and even for this artificial system there are so many that the "only practical means of finding the optimal combination is by suitable sampling." Two systematic methods of sampling are used, and the apparent optimal design is checked by marginal analyses that indicate additional beneficial changes. The final choice gives a figure of 811 million dollars for the present value of net benefits. A random sampling method gives 799 million dollars.

The book concludes with chapters on the mathematical synthesis of streamflow sequences; stochastic sequences; and political processes; none of which will be reviewed here.

As Hufschmidt says "the most striking feature of the net-benefit surface is its complexity". Of equally striking significance is the vast amount of information required for the specification of that surface

and the expense and delay that its collection must involve. Despite the general absence of such information and the marked reluctance to postpone feasible schemes until the existence of net benefits, let alone their relative ranking, has been demonstrated, economists (and presumably engineers and administrators) will find this book an invaluable guide to the methodology of planning water-resource systems, and a useful guide to the planning of most other sorts of systems.

D. W. G. TRELOAR *University of Western Australia, Perth.*

An Introduction to Sampling Theory with Applications to Agriculture. BY M. R. SAMPFORD. (London: Oliver and Boyd, 1962.) Pp. xxiii + 292, 30/- stg.

As an elementary text on sampling theory this well-written book can be warmly commended. It is not unlikely that it will displace the three standard English-language texts currently available in this field for undergraduate instruction.

The author sets out his aims succinctly in the preface. The book is intended "primarily as a logically developed account of the subject, suitable for agricultural officers and others who have occasion to use sampling techniques, but who are apt to be deterred by long and detailed mathematical arguments". However, the subject matter is not confined to the simpler sampling techniques; for, as the author points out, these are of little practical use. Clear expositions of systematic, stratified, cluster and multi-stage sampling follow chapters in which the elements of statistical theory and random sampling are discussed. Ratio and regression methods are discussed in a separate chapter.

Because of the book's intuitive approach to a subject which commonly receives highly mathematical treatment, and the provision of copious exercises at the end of each chapter, it is suitable for private study as well as for undergraduate classes. At the same time, rigour is not completely sacrificed, as cross references to detailed mathematical proofs are given throughout.

ALAN POWELL *University of Adelaide.*

Indonesian Economics, the Concept of Dualism in Theory and Policy. (Selected Studies on Indonesia by Dutch Scholars, Vol. 6). EDITED BY W. F. WERTHEIM, *et. al.* (The Hague: W. van Hoeve Publishers Ltd., 1961.) Pp. xii + 443, Gld. 19.75.

This is a valuable addition to an interesting series of books on Indonesia published with the aim of making the work of Dutch scholars available to the English speaking world. As in most of the other books of the series the editors have succeeded in bringing together a collection which is of interest not only to students of Indonesian affairs, but which will appeal to all who are concerned with problems of economic development.

Since the last War the concept of the plural society has become fairly well known to English speaking workers. Few, however, realise that the basis of the theory was laid down as early as 1910 in Boeke's doctoral dissertation or are aware of the controversies which Boeke's work have

created ever since. Most of the chapters in this volume are either Boeke's work, or are concerned with the earlier controversies; of the thirteen contributions which have been incorporated, only three were written in the post-war period.

If one speaks to Dutch workers one may easily gather the impression that Boeke's impact on economic thought in Holland has been negligible. This volume does little to eradicate this impression as all the contributions other than by Boeke are critical of his ideas. The editorial introduction is also written in the same vein, even to the extent that the editors found it necessary to state that it is by no means "intended primarily as a refutation of his (Boeke's) views".

The truth is, however, that Boeke has had a strong influence on economic thought in the Netherlands and that through his central position as Professor of Tropical Economics at the University of Leiden he has been able to stimulate thoughts on problems which were passed by previously and which, for instance, amongst English speaking economists were largely ignored until the late 'forties.

Boeke's great achievement has been to put forward the thesis that economic analysis as applied to Western economies is unsuited to analyse the economic life of tropical societies. He argued that in a number of Asian countries there is an essential and lasting difference between a capitalistic sector and a pre-capitalistic subsistence sector. The application of Western economic tools to such a dualistic society may be possible at times, but may be quite useless in other situations, particularly in studying socio-economic phenomena. Boeke is not concerned with the "pure" case of the pre-capitalistic sector but rather with a sector in which, as he says, "the more-or-less primitive warp is interwoven with a capitalistic woof" and which has been disturbed and weakened by the alien capitalistic elements introduced.

As Boeke rejected the use of Western conomic tools of analysis and stressed the limitations of the concept of economic man in dualistic situations, it is not surprising that economists reacted strongly. Indeed, probably the first public criticism was made by one of the examiners of his doctoral thesis who remarked that the object of the study was not economics; an objection to which Boeke, twenty years later, replied with "the more's the pity for economics".

Boeke's strong personal convictions and his inability, particularly in later years, to accept criticism did little to make his thesis popular. Yet it is probably fair to say that, consciously or unconsciously, Boeke has left a strong impression on the mind of those who were or are working in economic development.

Apart from the editorial introduction the volume is divided into two parts, of which the first and larger deals with the theory of dualism and the second with dualism and economic policy. A bibliography, mainly of publications in English, is appended. Although one may regret the absence of some authors in this collection, an almost constant complaint made by reviewers of these types of books, in general the editors have done an outstanding job in representing the opinions of Dutch scholars on the topic.

J. VAN DER MEULEN *University of New England, Armidale.*

A Report and Statistical Analysis of Factors Affecting the Yields of Canning Peaches on the Yanco No. 1 Irrigation Area, New South Wales. By L. N. Balaam and J. B. Corbin. (University of Sydney, School of Agriculture, 1962.) Pp. 100.

Balaam and Corbin have demonstrated much ingenuity in the handling of a multiplicity of data which was most unpromising material for decisive analysis. However, contrary to the observation in the preface that the method of analysis was unique, many studies of management techniques, have, because of the many variable factors involved, resorted to the use of regression analysis. In fact, linear models as used in this report appeared quite frequently in American farm management literature of the 1920's and 30's, and the more recent regression studies have taken production theory into account in the development of non-linear models.

The survey which is the subject of this report arose from a proposal in September 1955 made by the N.S.W. Section of the Canning Fruits Advisory Committee who had become "concerned at the relatively low average per acre yield achieved under Australian conditions, particularly as compared with the average yield obtained in California" (4-5 tons *v.* 10-12 tons). The Advisory Committee was of the opinion "that a survey of the industry on the Murrumbidgee Irrigation Area would help by indicating the factors adversely affecting yields and the reasons for the wide variation from farm to farm".

The study examines 19 factors believed to have an influence on the yield of peaches in the area, 14 of these factors being subjected to detailed regression analysis. The authors claim to have identified at least 85 per cent of yield variation. Watertable, soil, and tree size and pruning factors (together) accounted for 30 per cent, 25 per cent and 25 per cent of the variation in yield, respectively. Of the remaining 20 per cent, some was due to variation in tree density and percentage of small fruit, and the balance to factors not analyzed in the survey.

It is not possible to comment extensively on the analysis but mention could be made concerning the estimates of a quantitative relationship between watertable and yield. The watertable measurement used was the average of levels for August-October 1956 and this was related to the yields for the seasons 1956/7 and 1957/8. This would seem to provide little basis for concluding (in the Summary) that "Increases of the order of 200 per cent to 500 per cent on actual delivered yields (depending on variety and season) could have been achieved" by carrying out a number of practices which included "lowering of mean watertable levels to 7·0 feet". As watertable measurements were only taken to 6·5 feet there was no evidence that yield continued to increase beyond this point (except "that the effect of watertable height was continuous up to 6·5 feet and possibly beyond", p. 75). The point at issue is that although yield increases were "continuous" up to 6·5 feet, they could be continuing at a very much reduced rate beyond this watertable level. The marginal increments in yield are all-important for an economic decision on the depth to which drainage should take place, or, for that matter, the extent to which any innovation should be adopted. It is certain that the unit costs of drainage and possible pumping to reduce watertable at this depth would be rising rapidly, so that a constant increase in yield may not be sufficient to warrant drainage even to 6·5 feet. It could also be pointed out that the watertable measurements used (covering a period

of only three months) are hardly satisfactory data for estimating the quantitative relationship with yield.

Studies of this kind, if their objective is to recommend the commercial adoption of practices, must be designed for economic interpretation. It must be admitted that the kind of data which Balaam and Corbin had at their disposal does not lend itself to the task of defining production functions, but the apparent lack of any consideration of the economic implications of their findings has seriously limited the application of their work. It seems that the chief value of the study will be to provide "a valuable and comprehensive base for any future research into the canning peach industry".

G. MASON *Department of Agriculture, Sydney.*

Australian Domestic Product, Investment, and Foreign Borrowing, 1861-1938/39. BY N. G. BUTLIN. (Cambridge: Cambridge University Press, 1962.) Pp. xviii + 475, 65/- stg.

This book represents the culmination of Professor Butlin's diligent efforts over the years to build up a consistent set of historical statistics which would provide a firmer basis for studies of the development of the Australian economy. No discussion or interpretation of the figures is attempted in the volume under review. It is concerned primarily with the presentation of statistical series covering domestic product, domestic capital formation and overseas borrowing, together with the component series from which the aggregate figures have been compiled. The text, for the most part, consists of a detailed statement of the sources, methods and assumptions used in arriving at the various estimates.

One cannot but be impressed by the magnitude of Butlin's accomplishment. The book contains no less than 274 tables and the author modestly estimates that "a score or so million computations" lie behind them. Many economists and economic historians will be indebted to Butlin for the spadework he has done. But there is always a danger that those who subsequently use a standard reference work of this kind will accept too unquestioningly the figures provided. It is important to ask how reliable the estimates really are. Professor Butlin says that they are the best he can produce with the information at present available to him.

One is naturally inclined to base one's own judgments about the quality of the estimates upon what is reported with respect to the field one knows best. I must admit to being disturbed by the arbitrariness of some of the methods followed in arriving at the estimates for the rural industries. To take one extreme and admittedly minor example, what logic is there in Butlin's assumption that farmers' expenditure on spray materials is twice the national outlay on water for irrigation? Again, with what confidence can one make generalizations, as he does, about industry outlays on the basis of the accounts of a small group of large stations? I also felt disposed to query some of the author's assertions about production practices in the rural industries, assertions which in turn often provide the rationale for the statistical treatment of the data. It is clear that Butlin himself is fully cognisant of the limitations of his estimates and will use them accordingly. My concern is that other users of them may be less wary.

Despite the great lengths to which Butlin has gone to set down explicitly his sources and methods, he is rather imprecise in his citing of specific sources and he presents no bibliography. The consequence is a great deal of frustration for anyone who attempts to check the basis of any of the author's generalizations which he may be disposed to question.

The quantitative approach to the study of economic growth is always fraught with great difficulties and calls for first-rate detective work coupled with disciplined judgement. It is fortunate that a man of Professor Butlin's stature has undertaken this work, the publication of which is a significant event in Australian economics. One looks forward to Butlin's interpretation of developments in the period covered by this volume, and in particular to his forthcoming book on *Investment in Australian Economic Growth, 1861-1900.*

The Cambridge University Press is to be congratulated on the excellent format of this publication.

K. O. CAMPBELL *University of Sydney.*

Agricultural Price Analysis. BY G. S. SHEPHERD. (Ames: Iowa State University Press, 1963, 5th Edition.) Pp. vii + 328, $6.

"Agricultural Price Analysis" has now been in service for some 22 years and the fifth edition of this well-known text is now available. In his preface, Shepherd notes that this edition "includes a number of substantial changes and additions, to keep it abreast of the new concepts and techniques that are rapidly being developed in this field." An analogy is drawn with an axe that has had the head replaced twice and the handle replaced on numerous occasions. This is perhaps the optimistic point of view; the result could perhaps be better described as a hand driven circular saw in so far as it is less effective than the original axe, despite incorporating new concepts and techniques.

Shepherd has made an heroic attempt to be comprehensive and all inclusive with the result that many topics are treated superficially. For instance, the theory of income and employment, including the concept of the multiplier and factors determining investment, is covered in two pages. This exercise, which incidentally was contributed by the Chief of the Outlook and Projection Branch, E.R.S., would appear to be included merely to assert that "changes in expenditure for food are highly correlated with changes in consumer disposal income." In contrast, on page 136, when dealing with the graphic method of multiple curvilinear correlation the reader is advised to use red dots to distinguish them from black dots, or to use "a new clean sheet of graph paper." The mechanics of the method are given step by step and the detailed exposition shames many do-it-yourself instruction charts.

Certain parts of the text appear to have been included for effect rather than information. For example, in the chapter dealing with simultaneous equation techniques the reader is cautioned as follows:

> "The decision to use structural equations and the writing of the model, if the decision to use one has been made, depends on an intimate understanding of the real-world processes to be estimated and the variables which may be used. It is important that the equations adopted reflect reasonable, appropriate, and useful hypotheses about the world, as well as that they satisfy certain technical requirements of identifiability, consistency, and ease of fitting.
>
> "In addition to these theoretical and statistical standards, the analyst will often need to make special allowance for the eventual uses of the results, for

policy and other purposes. This bears on the choice of statistical techniques for fitting simultaneous equations as discussed above. In some cases bias in the estimates would be especially harmful; in other cases possible bias may matter little compared to other possible weaknesses . . ."

This may well be correct, but it is not very helpful.

Again, in dealing with geographical price differentials (p. 217) the variation in wholesale meat prices between New York and Chicago are cited. The data is for the period 1946-1949. It is noted that Chicago packers appear to act irrationally by ignoring substantial price differentials in excess of freight rates for several weeks at a time. This situation existed for several different cuts of both pork and beef. Shepherd concludes that there must be a valid reason for such behaviour and suggests "a study of the causes and effects of this situation would constitute a good marketing research project." In the intervening thirteen years it is not unreasonable to hope that Shepherd might have pursued this project himself and presented the results in his 1963, fifth edition.

More fundamental is the complete omission of any reference to surplus disposal under P.L. 480 and its effect on agricultural prices and incomes in recipient countries and third countries. The seven references to Mordecai Ezekiel's work in the Index do not include any reference to his recent Indian work in this field.

A very useful addition is Part VI, which presents the concept and evolution of Parity. Hitherto, a concise treatment of this keystone of U.S. price policy has not been readily available.

Finally, it is perhaps worth noting that the preface fails to specify for whom the book is primarily intended. This is what the Americans would call "a good question."

A. B. WARD

Massey University College, New Zealand.

Northwestern Australia. BY A. KERR. (Perth: Government Printer, 1962.) Pp. xii + 440, 55/-.

The amalgamation into one volume of widely scattered information on any particular subject is an important foundation on which successful research is built. Research workers are generally loath to conduct this type of research as it is most exacting and very time consuming. Furthermore, its value is often underestimated by most of those who probe deeply into one particular aspect of a problem. Perhaps the most important role of such research is in providing the general reader with the means of widening his knowledge of a particular region or subject.

These are the roles of this publication. It is aimed primarily at the general reader but it cannot fail to stir the specialist to pursue some of the economic problems raised. The book is well written, well planned and well documented. It is divided into two broad sections covering the physical and economic resources of the northwestern area of Western Australia. Wherever possible, chapters are set out in a standard way with an introduction; a brief history where applicable; discussion of major problems; a summary and conclusion; a bibliography; statistical tables and maps. As a result, we have an excellent reference book.

The wealth of information in the book makes review difficult but the main emphasis is on development during the 1950's. All industries underwent considerable change during this decade. Mining has re-

emerged as the main industry around which economic growth will proceed for the next ten to fifteen years. The pastoral industries passed through a "shake-down" phase. The sheep industry remained stationary and declined in importance within the State while the beef cattle industry showed steady growth. Fishing added new enterprises such as whaling. Agriculture, particularly irrigated agriculture, emerged as a new but important economic activity. The future prospects of all the industries up to 1975 provide an interesting and convenient way of bringing the book into focus.

In many ways, the book suggests that it was written by a geographer. Considerable emphasis has been placed on the relationship between the physical environment and the distribution of industry and population. However, occasionally the economic training of the author shows through, especially when he is outlining the proposals for large scale public developmental works. The avoidance of such emphasis on economic appraisal is perhaps the book's only weakness. Certainly it is time that the general reader and many specialists in economics, engineering, agriculture and politics were made aware of the need to examine the benefits and costs of many suggestions for developing the northern section of Australia, especially in regard to irrigated agriculture and the utilization of tidal power for the generation of electricity. Still given what the author has accomplished, any criticism of the study is hollow. It should be studied carefully by all who are interested in this "forgotten" area of Australia. Let us hope that some studies of the economic evaluation of the public developmental projects will not be long in following this excellent publication.

G. R. SPINKS. *Department of Agriculture, Stock and Fisheries, Papua.*