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BOOK REVIEWS

Rationalising Rustic Regulation. By E. SIEPER. (The Centre for Independent Studies, Sydney, 1982.) Pp. 87, ISBN 0 949769 029.

Many readers of this *Journal* will remember a paper of the same name as this monograph given by Sieper at the 1979 Annual Conference of the Australian Agricultural Economics Society. It was something of a *tour de force*, although far too comprehensive to be suitable as a paper and, if my memory serves me correctly, available only shortly before delivery. The profession owes a debt of gratitude to Parish for undertaking the editorial effort to reduce the somewhat voluminous conference paper to a readable monograph. Unfortunately the delay in publication has meant that some parts of the monograph have a dated appearance. Since 1979, agricultural policy formulation in Australia, thanks largely to the activities of the IAC, has moved away from the direct intervention that characterised so much commodity policy in Australian agriculture.

Sieper's rationalisation of intervention in the rural sector is to be understood in the context of income distribution objectives. Economists, of course, are familiar with the role of equity in the discussion of economic policy; indeed, the twin pegs on which policy discussion often rests are those of efficiency and equity, and the trade-off between them. In a brilliant exposition of the lengths to which the efficiency criterion can be overworked, Sieper discusses the 1974 'Green Paper' on Rural Policy. The approach in that paper was traditional enough in that it took efficiency as a criterion for policy analysis but acknowledged that market failure arguments would lead to government intervention. Most economists who have been placed in an advisory role to governments would be only too familiar with the pre-eminence of income distribution questions in the final decisions on policy measures that are taken. Political overtones often dominate any considerations of resource efficiencies. Such dominance should come as no surprise to readers of Thurow's *Zero-Sum Society* with its scintillating Chapter 6 on Regulation and Income Distribution.

Sieper opens his monograph by contrasting two theories of regulation. The first, which he designates the public interest theory, is dominated by legislative attempts to promote the public good. The state is seen as playing the role of the White Knight who has to intervene to overcome the 'bads' which are consequential on the failure of the market to achieve efficiency objectives. In something of an aside, and (given the publisher of the monograph) perhaps surprisingly not materially developed, Sieper contrasts the government as the agency which is concerned with achieving economic efficiency with Adam Smith's invisible hand, where the private pursuit of individual welfare was seen to lead to efficiency in resource use. Sieper, in a rather informative phrase, refers to the 'self-conscious concern for the public good' which seems to underlie the public interest theory of regulation.

The alternative theory of regulation, and one which would seem to be preferred by Sieper, is that the existence of state powers—principally

through tax collection—encourages the formation of interest groups anxious to gain access to the funds obtained through the exercise of such powers. The objective of this theory is to account for the coalitions which are formed to gain access to these funds and the ability of such coalitions to direct transfers in particular directions. A balance is struck between those who are recipients of the income transfers and those who are being taxed to provide them—balance in this sense referring to a political balance. Sieper leaves little doubt that he regards the outcome of policy decisions as largely politically motivated and politically determined. In successive chapters he goes through the major instruments which are used to effect these transfers. The instruments are import protection in the form of both tariffs and quantitative restrictions, production subsidies, export subsidies, export controls, pooling arrangements and two-price schemes and, finally, the use of supply controls in the form of quotas. Each of these instruments is subjected to critical review with encyclopedic references to rural policy going back well over 80 years in many cases. Sieper shows that many of these instruments have an ancient lineage in Australia's rural policy formation.

It is, I suggest, significant that most of the commodities that are subject to Sieper's critical review are sitting ducks. The commodities are dairy products, dried vine fruits, eggs and sugar, to mention the major ones. Each of these has had a long history of intervention by the state in both price and production areas. However the transfers are carried out, Sieper clearly reveals the preference by the recipients for instruments which partially disguise the transfers, since direct lump sum payments from budgetary subventions would be subject to annual renewal and be far too visible for comfort. Sieper is far less convincing in his attempts at rationalising regulation in the farm sector when he comes to deal with the major commodities wool, wheat, beef and sheep meat. Wool hardly rates a mention in the monograph, somewhat surprising in view of its importance, and perhaps it does not fit neatly into Sieper's framework. Indeed many of us will remember the divisions between the graziers adamantly opposed to any form of government intervention—including such a relatively minimal form as a reserve price plan—and those wool and meat producers advocating compulsory acquisition by a statutory body. Similarly, sheep meat and beef do not currently provide an example of government regulation which can be rationalised in terms of the attempts to effect transfers from consumers, or taxpayers, to producers.

Even in the case of the wheat industry, which does get the Sieper treatment, the argument is far from convincing, since the direction of the transfers is dependent on the time period over which the transfers are analysed. Up to the present, the transfers since the first wheat stabilisation scheme have been away from producers to consumers. Wheat producers are well aware of this and it is one of the reasons why they are so insistent, unless they can trade it off for something else, on maintaining a domestic consumption price for wheat which is 20 per cent above the export price.

There are a number of statements in the monograph which might well be challenged on the basis of fact. For example, this reviewer is not aware that the area restrictions on rice growing in Australia exist to control downstream salinity because of the 'large quantities of irrigation water applied'. I suggest the controls have a much more direct objective.

In the case of wheat, Sieper, in my view, overstates the ability of quarantine regulations to exclude imports of wheat. Although we have had only limited imports of wheat, usually associated with periods of domestic drought, the use of the quarantine regulations might be a weak reed to exclude the imports of wheat *and flour* into Australia if the price differential between wheat on the domestic market and export wheat becomes sufficiently large to act as an incentive to import. Sieper would also appear to be on relatively weak ground when he discusses regulation in the cotton industry when he alleges that such regulation failed entirely over 35 years to establish the significant cotton growing industry that was its original objective.

It should not be thought that the transfers consequential on rural regulation are from consumers (taxpayers) to producers. As Sieper rightly points out, a number of these transfers are between producers of different commodities; for example, the increase in the price of orange juice consequential on increases in the tariff will benefit producers of alternative beverages. The examples with respect to product substitution are well taken. However, I believe that Sieper does not deal adequately with the problem of product price instability if prices are to perform the function of guiding producers on product combinations. Gross instability in price can hardly provide a rational basis for decision making by producers. They may well opt to trade off a lower average income for a reduction in the instability of income.

One of Sieper's main arguments is that political forces can affect the size and direction of transfers but it is not always clear how political force is to be measured. For example, in the discussion on the negotiability of hen quotas, Sieper in one paragraph seems to be arguing that restrictions on negotiability would be desired by the industry in order to maintain its effective political size. The measure of political size is not given although, by implication, it would seem to be the number of producers. In the next paragraph Sieper argues that small producers who are thinking of quitting the industry will favour negotiability so that they can appropriate the rents which have been incorporated in the quotas. The increasing concentration in egg production might very well lead to greater political clout by a few large firms able to exert considerable pressure on government, rather than that which is exercisable by an atomistically structured industry with many small producers all pushing and pulling in different directions.

In summary, Sieper's monograph contains many brilliant and insightful ideas. Its main strength is that it focuses specifically on the ability of some producers in the rural sector to obtain regulation by the state and to use that regulation to effect transfers in their direction. As a generalised theory to explain rural regulation *in toto* it would seem not to have succeeded with respect to a number of Australia's major rural commodities. The other deficiency in the monograph is that, in some factual areas, the argument is not sustained and many of the examples are now somewhat dated and of historical interest rather than guides to policy makers for agriculture in the 1980s.

F. G. JARRETT

*University of Adelaide,
Adelaide, S.A. 5001*

Measuring a Country's Gains From Research: Theory and Applications to Rural Research in Australia. By G. W. EDWARDS and J. W. FREEBAIRN. (Australian Government Publishing Service, Canberra, 1981.) Pp. 154, ISBN 0 642 0 67 06744 9.

In contrast to the authors of so many books, Edwards and Freebairn (hereafter EF) make no claims about the suitability of their book for the advanced undergraduate, the beginning postgraduate, the professional researcher *as well as* the proverbial intelligent layman. This study on the allocation of rural research resources was sponsored by the now defunct Commonwealth Council for Rural Research and Extension, and it is clear from the contents that the intended market was the rather limited number of rural research administrators and other specialists interested in the above topic. Other readers of this review can safely conserve their bookshelf space for other publications unless they wish to impress their colleagues with their eclecticism.

The four main tasks which the authors set themselves in preparing the report were:

- (a) to specify an analytical framework that conceptualises the outcome of research in economic terms;
- (b) to assess trends in those variables which the analytical framework shows to have an important bearing on the pay-off from research;
- (c) to provide some quantitative illustrations of Australia's gains from its research into rural industries; and
- (d) to point to implications for research policy.

EF tackle the first task in Chapter III, and have provided a particularly lucid exposition of the cost-benefit framework which most economists argue should serve as the basis for allocating research resources. In addition, they have made an original contribution by extending this framework in at least two important respects. One extension, which is developed in more detail in Appendix 1, involved analysing the distributive effects of innovations in the 'middleman' sector of the marketing chain as well as in the input-supplying industries and in farming. The more important extension, particularly in terms of measuring national research benefits, was the development of formulae for measuring research benefits arising from process innovations in industries producing internationally-traded goods. These formulae supplement those previously developed for the closed economy case, and provide more precise estimates of research benefits for Australia's large export-oriented rural industries than the previous practice of substituting an aggregate or world demand curve for Australian production into a closed economy model. Using these formulae, EF are able to demonstrate that the size of the research benefits which a country can capture are substantially reduced if the technology used to produce exported commodities is exported along with the commodities.

A contrasting and less predictable result is the finding that, for import-competing industries, exporting the innovations developed by Australian rural research actually increases national research benefits due to gains conferred on Australian consumers from lower prices. EF also extend their analysis of the open economy case to encompass two specific forms

of government assistance, namely, export subsidies and home consumption price schemes with price equalisation. They conclude, contrary to conventional wisdom, that such schemes need not reduce the potential economic value of rural research, but the generality of this finding remains in doubt, given the highly restrictive nature of the simplifying assumptions made.

Unfortunately, EF have been less successful in overcoming several other deficiencies in the economist's approach to the allocation of research resources. In common with most other writers in this field, they restricted their analysis to applied research, and also excluded research leading to product rather than process innovations. More seriously, while the authors recognised the importance of the size of the reduction in unit costs of production generated by research, this aspect received almost no further attention apart from noting the difficulty of estimating this parameter in practice. Given the track record of research organisations to date, it is a moot point whether such estimation should be the sole province of scientists, as suggested by EF, rather than based on a co-operative effort between scientists and economists. Another weakness is the lack of recognition that much rural research is location specific, with the result that research benefits often will not vary directly with total industry production as claimed by the authors (p. 41).

In executing the second task above, the authors concentrate on current and future industry structure and, in particular, on likely future commodity prospects and trends in input costs. While this material (in Chapter IV and Appendixes 2, 3 and 4) is the least original part of the book, it comprises a competently compiled compendium of pertinent information about Australian agriculture which, until it becomes outdated, should serve as a useful reference source for rural scientists and administrators who accept the logic of the approach advocated by EF.

The third task of integrating the analytical framework with the above empirical evidence is the other major contribution contained in this work. The results are reported in Chapter V, and comprise estimates of the potential gains from research that results in a 10 per cent reduction in per unit production costs in most Australian agricultural industries. Such results should be the most interesting part of this study to agricultural administrators and policy makers, but may generate a degree of controversy among rural industry groups. For instance, the authors (p. 75) conclude that:

. . . the gains from a 10 per cent reduction in unit costs in the wool industry, the biggest industry in terms of initial value of production, are less . . . than the gains from the same reduction in the wheat industry, and [may be less] . . . than the gains from a 10 per cent cost reduction for beef and veal.

However, useful as these findings are, they beg the other important question of the cost of research necessary to generate a given reduction in per unit production costs, and whether there are systematic inter-industry differences in this research cost variable. Furthermore, the results presented in Chapter V provide no guidance on the inter-disciplinary allocation of research resources, which probably is a more critical issue for research managers, given that scientific human capital typically is more discipline specific than industry specific. One other

minor quibble concerns the discount rates of five, ten and fifteen per cent used by EF in calculating potential research gains. The uninitiated are likely to gain the impression that EF favour the results obtained using the middle figure, which seems inordinately high for a long-term real discount rate.

The policy implications perceived by EF are scattered throughout the text, but are restated as part of a 12-page 'summary' which is sufficiently detailed to get across most of the important messages spelt out more fully in the body of the book. Notwithstanding the qualifications noted above, this is clearly the most important Australian work to date on this topic, and deserves to be purchased and carefully studied by all managers of rural research. Regrettably, I suspect that most of the persons who should read it will be put off by the fairly technical nature of much of the contents and will leave it to gather dust on the bookshelf. For those who persist, comprehension will be hindered by some poor punctuation, and by some unfortunate typographical errors, such as that on p. 26, where area FGKJ should equal $\triangle P.Q$, and in the first line on p. 46 which presumably should read:

$$ABLG + LCH - GDH - (GEF - GDH).$$

Finally, policy makers looking for cookbook type recipes to tell them how to allocate research resources are likely to feel let down by this book, but this is much more a reflection on the intrinsic complexity of the problem being addressed, and on the limited nature of economists' contribution to its solution, than on the manner in which Edwards and Freebairn have discharged their allotted task.

R. K. LINDNER

*University of Adelaide,
Adelaide, S.A. 5001*

Science and Technology Policy. Priorities of Governments. By C. A. TISDELL. (Chapman and Hall, London, 1981.) Pp. 222, ISBN 0 412 23320 7.

Tisdell's book had its genesis in 'an independent background report on the subject of priority assessment in science and technology policy' prepared for the Australian Science and Technology Council. The book incorporates this report and also contains extra material. In this book, Tisdell tries to do two things. The first is to extract what guidance analytical economics can offer to those interested in formulating and planning science and technology policy. The second is to review the science and technology policies that have been adopted by selected OECD economies. Reflecting these aims, the book comprises two main sections. In the first half of the book, Tisdell examines, in a fairly abstract fashion, many important issues in delineating options and priorities for science and technology policy. The rest of the book comprises two chapters in which the science and technology policies of four large economies (West Germany, Japan, the U.K. and the U.S.A.) and five small economies (Belgium, Canada, the Netherlands, Sweden and Switzerland) are outlined. In the final chapter, Tisdell reflects upon observed developments in science and technology policies and upon the

future. In an attempt to win readers, Tisdell says that the reading of the main analytical chapters (Chapters 2 and 3) is not essential for comprehending the later material.

The scope of science policy, says Tisdell (p. 31), includes:

. . . education, the stock of knowledge, its availability and use, and research and development. *Technology policy* is concerned with the adoption and use of techniques—innovation, diffusion of techniques and their replacement.

Apart from any (considerable?) value that may be assigned to knowledge as such, science (pure or applied) has a pay-off only if it results in or contributes to a technological innovation.

In the first section of the book, extensive use is made of diagrams to illustrate the way in which economic principles can help in thinking about decisions on science and technology policy. In considering the optimal allocation of scientific resources between the production of ideas at home and the import of ideas, Tisdell posits an 'import-domestic production science frontier' with complementary segments as one moves from situations of zero domestic production of ideas or of zero imports of ideas. That is, the allocation of some resources to domestic science increases a country's ability to recognise and utilise ideas from overseas, and the import of ideas will, within limits, increase the productivity of resources devoted to domestic research. Analysis of the relationship between research effort and the time required for a research breakthrough, points to the result that duplication of research effort increases the time needed for a breakthrough with a low level of funding and reduces it when funding is adequate. The delineation of efficient and inefficient combinations of basic and applied research in Figure 2.9 will be hard for the non-economist reader to comprehend.

A brief but interesting account is provided of the care and use of the stock of knowledge. The notion of 'stemming knowledge' is introduced to categorise the extra knowledge that is created as a result of the use of a repository of existing knowledge. This is seen as one reason for subsidising publications. The trade-off between possible cost reductions from the centralisation of library facilities and the increased risk of loss due to a catastrophe is noted. Tisdell agrees with Carter and Williams (p. 39) that:

. . . it is easy to *impede* growth by excessive research, by having too high a percentage of scientific manpower engaged in adding to the stock of knowledge and too small a percentage engaged in using it.

If science and technology policy is intended mainly to facilitate the development of new technologies, 'it is important to know the main sources of these technologies so that government assistance is not misdirected' (p. 77). Tisdell points out that views differ on the extent to which technology is developed without science by trial and error or by rearranging existing technologies. The limited evidence which he presents suggests that the direct links between basic science and technology are not strong, though he considers that the indirect links between basic science and technology, via the 'technology bank of ideas' for example, may be important. A study entitled *Technology in Retrospect and Critical Events in Science* (1968), prepared for the U.S. National Science Foundation, points to a more substantial contribution from basic

science. About 70 per cent of the key events leading to five important innovations were considered to result from non-mission oriented research. In a study by Langrish et al. it was found that successful innovation in the U.K. was associated with five characteristics: appreciation of user needs; attention to marketing; efficient performance of development work; effective use of outside knowledge; and high rank of the individuals responsible for the innovation. Consideration of the policy implications of this finding would have been interesting. Do the findings point, for example, to a case for subsidies on market research and development work? Or is it enough for a government wishing to encourage innovation to *publicise* observed differences between successful and unsuccessful innovators?

Tisdell distinguishes seven 'economic' reasons for government intervention in the area of scientific and technological effort. These are: inability of individuals to appropriate an adequate share of the gains from their efforts; risks and uncertainties; ignorance; imperfections in capital markets; avoidance of wasteful duplication; national security; and industry-wide external economies of development. The analysis of these issues lacks the penetration that many economists would seek and, indeed, that is to be found in explorations made elsewhere by Tisdell.

The accounts of science and technology policy in the four large and five small economies are primarily descriptive and draw heavily on documents from the countries concerned. The main feature that emerges is the trend toward the more careful and explicit determination of goals and the allocation of resources in accordance with these goals. Since the mid-1970s, increased emphasis has been placed on the goal of increasing the international competitiveness of industry. In most countries, less emphasis has been given to 'quality of life' objectives, and to research and development for defence, space and agriculture. The priority accorded to international competitiveness in science and technology policy is greater in Japan and Germany than in the U.S.A. or the U.K. The former countries also have more comprehensive science and technology policies than the latter, as do the Netherlands, Sweden and Canada. The U.K. (more accurately, Britain) stands out from the other countries in moving away from centralisation of science and technology policy. Each government department is expected to define its objectives for applied research and development and, in undertaking research, to follow the customer/contractor approach recommended in the Rothschild Report. Priorities in basic research are left largely to the scientists.

How successful have the various countries been in achieving the goals of their science and technology policies? Perhaps because it is so difficult to answer this question, Tisdell devotes little attention to it. The small economies are judged 'to have remained flexible in their science and technology priorities and seem to have reacted promptly to changed world economic conditions' (p. 184). It is suggested (p. 200) that the relative success of Germany, Japan, Sweden and the Netherlands and the relative failure of the U.S.A. and the U.K. to achieve low unemployment and inflation and high economic growth, is due largely to differences in the success of science and technology policy. In view of the large number of interacting influences determining a country's macroeconomic performance, the absence of reasoned support for this suggestion is a significant deficiency.

Of the many questions asked in the book, a substantial proportion is not resolved. This is not surprising, given the nature of the subject – and of the questions. For example: ‘Should scholarships be varied in value or in available number by fields to encourage desired changes in the composition of graduates?’ (p. 36). Is the increasing emphasis on the use of science and technology policy to enhance the international competitiveness of industry desirable? (p. 200). Are scientists ‘merely agents of the dominant management/corporate group in society . . .?’ (p. 197). ‘How can agreement be obtained about collective ends?’ (p. 204). Those interested in science and technology policy in the Australian context should note that some of the key questions are discussed by Jarrett in a paper (*Search*, March 1976) that is omitted from Tisdell’s extensive notes and references.

As with much in life, Tisdell’s book is a mix of the good and the not-so-good. It is unlikely that any politician, economist or policy adviser could read it without obtaining useful insights into the determination of goals for science and technology policy and the allocation of resources to achieve those goals. Their benefits will be reduced if they skip the analytical chapters and enhanced if they are goaded into further thinking by statements at which they balk or by questions which are left open.

G. W. EDWARDS

*La Trobe University,
Bundoora, Victoria, 3083*

Economics and Resources Policy. By JOHN A. BUTLIN (ed.). (Longman, London, 1981). Pp. 206, ISBN 0 582 45074 8.

This book is a collection of readings in natural resource economics designed for undergraduate students. It is a welcome addition to the literature because most books about natural resource economics cater for graduate students. The book is based on a central theme, namely, that the application of economic theory to resource management problems enables the formulation of useful policy.

The book is in five parts. The first contains three readings dealing with the adaptation of economic theory to the management of natural resources. The first chapter, by Butlin, is an attempt to bring environmental and resource problems into perspective. The second chapter, by Meade, is an excellent review of Neo-Malthusian models. In his treatment of these models, Meade argues that a more important reason for global doom than the finite and irreversible nature of resource constraints is the extravagant consumption patterns exercised by the present generation. Meade further shows the need to define clearly all economic and resource factors in the definition of resource management models. If not, the policies that evolve from these models could prove to be nonsensical. The third chapter, by McNerney, is a simple but excellent adaptation of Fisherian capital theory to the management of natural resources. This adaptation enables the definition of optimal rates of extraction for renewable and non-renewable resources within an intertemporal framework.

The second part (three chapters) deals with intergenerational conflicts in the extraction of non-renewable resources. Chapter 4, by Heal, is an

evaluation of choice criteria in the conflict between efficiency and equity in intertemporal extraction. The fifth chapter, by Page, is an extension of Heal's chapter in the sense that Page includes the consideration of secondary materials (such as scrap) and virgin materials. The sixth chapter, by Grout, is an attempt to establish optimal resource extraction strategies in the light of microeconomic welfare theory.

In part three, renewable resources are considered. The two chapters in this part are devoted to the open-access fisheries. In Chapter 7, Copes demonstrates the formulation of fishery management policies from a comparative static model. In Chapter 8, Munro develops a dynamic theory for the management of the fishery resource.

The problem of pollution control is dealt with in part four which contains two chapters. Butlin argues, in Chapter 9, that control measures such as user and product charges may provide real social gains over and above administrative and transactions costs. Chapter 10, by Marquand, is an evaluation of the corrective tax measures for pollution control. This chapter reveals the complexity of information required to formulate the appropriate tax measures.

The final part deals with international aspects of resource management. Chapter 11, by Walter, is a review of environmental diversity among nations and the various interactions between international trade and environmental policy. In Chapter 12, Potier evaluates the role of international organisations in environmental management.

As the editor himself concedes, the chapters by Grout and Munro could prove difficult for the average undergraduate student. Apart from this problem, the collection of papers is very readable and provides the reader with the relationship between economic theory and resource policy. However, the book does not cover all aspects of natural resource economics. For example, topics such as the current issues and problems in the extraction of energy resources, water resources, and the valuation of intangible goods and services provided by the environment are notable omissions. Hence it could not be used as a textbook. Rather, it could be used to supplement a conventional textbook or a comprehensive set of lectures on the subject.

DODO J. THAMPAPILLAI

*University of Wollongong,
Wollongong, N.S.W. 2500*

Salinity in Irrigation and Water Resources. By DAN YARON (ed.). (Marcel Dekker, New York, 1981.) Pp. 432, ISBN 0 8247 6741 1.

Salinity in irrigation and water resources is a complex problem affecting about one-third of the world's irrigated lands. The public good characteristics of water resources, the non-point nature of salt pollution and the inevitable lag between irrigation development and the emergence of salinity, mean it is a difficult and seemingly intractable problem to resolve. In compiling this book, Yaron drew on the conviction that (p.v), 'complex real life problems cannot be solved by a single discipline and that an interdisciplinary approach is needed'. He proposes that the interdisciplinary approach be viewed as a system which decomposes the problems into specific elements, each to be analysed using the techniques and

the terminology of its own discipline. This approach is the theme which runs through most of the book.

Whilst salinity gets an airing from many different perspectives, there is a disjoint nature about this book. This is probably inevitable with 16 chapters written by 26 contributors, but it is reinforced by the inclusion of some chapters that are not specifically oriented to the subject and the limited cross referencing. On a more important note, the book is already dated—the prices used in some chapters and the referencing indicate that most chapters were written in 1975 or 1976. There are also many typographical errors. Notwithstanding these relatively minor criticisms, the book contains much worthwhile material written by people well qualified in their respective fields.

The first chapter of the book is an introductory review written by Yaron in which each of the following chapters is summarised—a useful facility for focusing the reader's interest. Chapters 2 through 5 cover technical aspects of salinity. Chapters 2, 3 and 5 can be readily understood by the layperson and are very useful references, but Chapter 4, on Irrigation and Soil Salinity, would probably be incomprehensible to most readers of this *Journal*. The theme of Chapter 2 is that water quality is related to the management practices available to irrigators. The question about water quality is not so much 'how good is the water?' but rather 'what can be done with this water?'. Chapter 3 on salinity and crop yields is written by a noted authority on the subject, Bernstein. Yield losses occur when the salinity of the soil water increases, principally because the reduced osmotic potential of the soil water inhibits uptake of water by the plant's roots. However, specific ions can have toxic effects. Bernstein reproduces his much-quoted tables which show soil water salinities consistent with specific reductions in yield for many commercial crops. In Chapter 5, fertilisation and salinity are discussed and, while acknowledging that different crops respond differently to fertilisation in saline conditions, draws the conclusion that moderate soil salinity can be partially compensated for by increased fertilisation.

Irrigation on an interregional or watershed basis is discussed in Chapter 6. A distinction is made among three phases of irrigation projects:

- (a) the delivery phase;
- (b) the farm irrigation phase; and
- (c) the water removal phase.

By evapotranspiration, the salt that is brought onto the farm in irrigation water is concentrated and, along with salt picked up in the subsoils, it is eventually returned to the river system by return flows or groundwater flows. Surface drainage also contributes to the deterioration of water quality. By these means, upstream irrigators pollute downstream waters which may in turn be the source of supply for other irrigators or for urban supply—an external diseconomy exists. Empirical studies which go part of the way to quantify the externalities involved are presented in Chapters 7 through 10. All are based on irrigation in the Colorado River Basin.

By combining linear programming with production functions, which exhibit diminishing returns to increasingly saline irrigation water, the effects on the farm income of the typical downstream irrigator are ex-

amined in Chapter 7. The economic consequences of restricting the return flows emanating from upstream farms are explored in Chapters 8 and 9. In Chapter 8, Hanks and Andersen develop physical and economic models of the farm. A physical model of the farm simulates the relationships affecting plant growth. If the salt flow into the groundwater is restricted, the conditions for plant growth are altered. By relating the relative transpiration rates produced by the physical model to relative yield functions, data are produced for use in the economic model. This is a linear programming model for estimating the effect on farm income of progressively lessening the amount of salt that is allowed to leave the farm. The results suggest that the shadow price for small reductions in return flow is much less than alternative control measures, but that a zero discharge standard would be very costly.

In Chapter 9, the results of a further linear programming model are reported. In this case, models of five representative farms are used and return flows are incorporated in each crop production activity by a coefficient representing annual losses due to deep percolation. They are thus much simpler models. The authors, Young and Leathers, suggest that the negligible marginal price for water, and the lack of strict controls on diversions, mean that irrigators use amounts of water which are in excess of crop requirements. By constraining water supplies, their farm models indicated the need for more frugal and costly irrigation techniques. It was estimated that up to 62 per cent of salt discharge could be avoided at a cost of less than US\$2.00/t (1975 prices) which is a similar result to that produced by Hanks and Andersen. However, this analysis does not allow for the possibility of decreased water usage and increased yields. For instance, in the Mallee region of Victoria, the replacement of furrow irrigation of vines by overhead sprinklers can reduce water consumption, lessen drainage loads and, by more uniform wetting, increase yield.

In Chapter 10, the scope of the economic analysis is extended to the interaction between upstream and downstream regions of the Colorado River. The agricultural benefits to the downstream region of reduced salt loads are estimated using yield declination curves, and the effect on regional income is estimated using input-output models. A supply schedule for reducing salt loading by upstream users is derived and compared with the marginal benefits to downstream users. Marginal benefits are assessed for combinations of the short-term or long-term profitability criteria and whether forward linkages between agriculture and industries using agricultural produce are considered. The authors argue that, because increases in salinity are gradual, the most plausible combination is no forward linkages and long-term profitability. By this it is meant that, in the long term, agriculture is maintained only if fixed and variable costs are covered and, because of the gradual change in agricultural output, the endogenous using sector has time to devise options such as seeking supplies from exogenous regions. As a result, no multiplier effect is felt in the study region. Despite the scope of the analysis, no comment is made on the implications of the results for the justifiable expenditure on salinity control. However, examination of the incremental cost and benefit schedules suggests that only the adoption of improved practices of farm irrigation would be warranted. No suggestion is made of how upstream irrigators should be encouraged to adopt those measures.

The authors of Chapter 11 stray from the theme of the book. Heady,

Nicol and Wade deal with improving water quality and non-point pollution from a soil-loss perspective. Their contribution is based on a formidable multi-regional programming model which, with 223 producing areas, 51 water supply regions, nine land classes in each production area, many cropping activities and 25 market regions, covers the entire U.S.A. The consequences of imposing soil-loss restrictions on agriculture were increased use of pesticides, a transfer of water from upstream to downstream regions, interregional redistribution of farm income and a reduction in consumer welfare through higher prices for agricultural commodities. Apart from the expressed intent of the authors to extend their rather ambitious and, some might argue, unrealistic model to deal with salinity, Chapter 11 does not bear much relevance to the rest of the book.

Cost-sharing and pricing for water quality is the subject of Chapter 12. This is a good theoretical chapter in which the authors (Fishelson and Tolley) argue that, to maximise social welfare, efficient solutions to the externality problem caused by salinity should be sought, and that cost-sharing or pricing arrangements should be tailored to suit. Because this may involve a redistribution of wealth, there may be political opposition to such solutions. It is noted that major advances have been made in the measurement of benefits from improved water quality in the agricultural sector, whereas little has been done to evaluate municipal and industrial benefits.

The remaining chapters are a mixed bag of readings. In Chapter 13, Johnson covers the legal and institutional approaches to salinity management with emphasis on the Colorado River Basin. Johnson sees salinity as a problem associated with well-developed river basins in which:

- (a) cultural and political attitudes are firmly entrenched;
- (b) water is substantially committed; and
- (c) control is decentralised.

It is not surprising that Johnson recommends a unified approach to management of the whole river basin. What is disappointing about this chapter is the absence of any discussion of the legal and institutional aspects of transferable water rights. Desalination technology is reviewed in Chapter 14. It is evident that the high cost of desalination limits its application for irrigation.

The last two chapters diverge from the theme to deal with the arid zones. A discussion of the management of water resources in the arid zone, written from a planner's perspective, is included in Chapter 15. Despite the jargon, the chapter has a clear message, namely, that water resources should be developed and managed in an integrated or systemic manner and that, where there is rapid demographic and economic growth, systemic planning will be required in arid zones well before it would be required in more humid zones. Unfortunately, the author steps across the disciplinary barrier to criticise discounting techniques and, in so doing, displays the gulf of misunderstanding that still exists between economics and other professions. He maintains that, once conservation and the maintenance of steady states are accepted, discounting would not be justified. However, this fails to acknowledge that capital resources are finite and must be allocated in the best possible manner. If there are different ways of achieving conservation objectives, and each have

different patterns of costs and benefits, discounting is essential for achieving the best possible allocation of capital both within the water sector and between the water sector and other sectors of the economy.

The final chapter on the future of arid lands does not deal directly with salinity. Two hypotheses are put forward by the authors; namely, that climate tends to affect per caput income and that aridity decreases per caput income. Data were collected for 118 non-communist countries and used in regression analysis. The results support the two hypotheses, though the variability in per caput income explained by the regression was generally low (the highest R^2 value was approximately 0.5). The authors acknowledge that it is a modest statistical analysis but the poor explanation of variance, which could be due as much to the omission of relevant explanatory variables, such as mineral or hydrocarbon wealth, as to problems of data quality, must limit the usefulness of the results.

This book could be judged on how well it portrays the interdisciplinary approach to solving the complex problems that editor Yaron expounds, but the case is not conclusive. The book contains examples of specific components of the 'salinity problem' which have been prepared by persons of the specific discipline. It also contains chapters not entirely relevant to the subject. Perhaps the essence of an interdisciplinary approach is better illustrated by some of the applied economics chapters in which economists and other scientists have collaborated to produce a well-rounded study. Whichever way you look at it, Yaron's book makes a useful general reference.

PAUL BELIN

*State Rivers and
Water Supply Commission,
Armadale, Victoria, 3143*

Microeconomics of Markets. By C. A. TISDELL. (John Wiley and Sons, Brisbane, 1982.) Pp. 626, ISBN 0 471 33383 2.

Relatively few years ago it was extremely difficult to find a quality microeconomic text written around the Australian market. That situation changed dramatically during the last few years and Tisdell's book now joins the new breed of economic texts coming out of Australian universities.

Microeconomics of Markets developed from Tisdell's earlier book *Economics of Markets* but, apart from a complete updating of the material, it broadens the microeconomics scope to encompass aspects (and case studies) of principle and practice not normally found in the standard theory text used in undergraduate courses. For example, in addition to the traditional core aspects of microeconomics, Tisdell shows the applications of the principles to agricultural economics, international trade, public finance, welfare economics, managerial economics, economic growth, environmental and urban economics.

The strength of Tisdell's broad treatment of microeconomics is its underlying relevance to major *areas* of economics—such as agricultural economics or public finance. For example, in Chapter 4, after expounding the conventional theory of supply and demand analysis, together with exogenously imposed constraints on the free market, such as quotas and price controls, Tisdell illustrates the principles of analysis by

reference to Australian agriculture and international trade. In the case of the agricultural illustration, his treatment extends from the reasons behind the changes in our terms of trade for farm products, to quotas, subsidies and other measures applied in attempts to stabilise prices and raise farm incomes.

For those of us prone to teach over a wide range of subjects, or let our research interests stray from the one narrow field, Tisdell's book will be an extremely useful reference point. The 'review' of Australian agricultural pricing arrangements in Chapter 4 has already been mentioned. However, the coverage is much wider than that. For example, the synopsis of Issues in the Public Provision of Education in Chapter 14 is one of the best summaries of this controversial area of economics seen by this reviewer. It would certainly be an excellent starting point for trained economists new to the area, or others returning to the area after a long absence.

Despite its wide coverage of both principles and applications of microeconomics in Australia, there are (as Tisdell clearly acknowledges in his Preface) some gaps, but these are more in the nature of 'operational research' topics and are rarely attempted in the normal undergraduate teaching of microeconomics. Besides Tisdell was faced with several trade-offs; a bigger or smaller book; more detailed explanation of concepts covered or less; and so on. This reviewer found the combination adopted quite satisfactory.

It is always possible to quibble about small details in a book such as this. For example, one would have liked to see some distinction between the terms 'labourforce' and 'workforce' used in Chapter 2. Similarly, some important concepts rate a mention, but nothing more. This happens, for example, in Chapter 14 when the term 'cross subsidization' is introduced (p. 448), but is not defined or explained. However, the overall relevance of these points of complaint are small, and they are usually attributed to sins of omission rather than sins of commission through error. Thus, those of us who teach and have our own pet areas of emphasis can, if we wish, safely rely on the book for student reference, and embellish our lectures with different illustrations and with more details than those contained in the book.

The material is presented in a clear and logical manner. Printing is across the whole page, so we are saved the kind of eye-strain becoming fashionable in some publishing houses where the material is presented in column form. Each chapter concludes with a summary of the 'main points', a list of 'key concepts', some questions, and a list of further references. Within the text, the titles and sub-titles are in colour (orange), while the key concepts of the chapter are presented in bold type. We have come to expect a very detailed index in Tisdell's books, and again he has not disappointed us.

NORM THOMSON

*University of Adelaide,
Adelaide, S.A., 5001*

The Farming Game. By J. P. MAKEHAM and L. R. MALCOLM. (Gill Publications, Armidale, N.S.W., 1981.) Pp. 560, ISBN 0 9599985 7 8.

The Farming Game is a rule book about how to succeed in the contest, or game, of running a farm business in the arena of Australia's farm business environment. The authors chose this unorthodox title to reflect the challenging and dynamic nature of farm management. Nevertheless, the book is essentially an orthodox text on farm management economics.

Any textbook on farm management must be assessed from two points of view: first, the methods the authors expound for whole farm planning, and second, the content or the techniques and examples the authors present to enable people to carry out the underlying methods.

Unfortunately, the discipline of farm management has developed in a lopsided manner with far too much attention being focused on developing content and very little on debating the underlying methods of whole farm analysis and planning. *The Farming Game* suffers from this general problem. Although a method is presented in Chapters 1 and 3, it is neither developed well enough nor stated sufficiently explicitly. However, this reviewer sees the basic method presented involving the reader in working through a large check list (presented in Chapter 1). The check list covers a variety of human, physical and financial factors which start, quite correctly, with the farmer's goals and skills. After a brainstorming session working through the check list, the farmer, consultant or student may identify some aspects of the farm business which have potential for improvement. This potential can be explored and analysed more fully by using the techniques and principles outlined in the rest of the book. In particular, the technique of partial budgeting is described as the crux of the decision process (Chapter 9). Finally, whole farm plans can be drawn up and controlled by using the techniques shown (Chapter 21). Alternative methods for viewing whole farm analysis and planning (for example, a systems approach) are not presented.

Turning from the question of an integrating method (presented mainly in Section 1) to the content, that is, techniques, principles and examples (presented in Sections 2, 3 and 4), it is in this area that Makeham and Malcolm make a very worthwhile contribution. The authors of no other Australian text have covered such a wide range of farm management topics in one volume. Because of this, the book extends to 560 pages of small print.

Following the Introduction, the book has ten chapters on Basic Farm Economics and Management in which the authors introduce the reader to some basic production economics principles, and to the techniques of drawing up whole farm budgets and testing alternatives with partial budgets. These chapters are clearly presented although one point of inconsistency is the failure to include interest costs in livestock gross margins. Since the capital requirements per hectare for a range of grazing enterprises can differ very markedly, this cost (whether it be an actual or an opportunity cost) should have been included in the livestock gross margins. This is a strange omission, as the concept of opportunity cost is explained lucidly in the book.

Chapters 13 through 21 are grouped in a section entitled Applied Farm Economics and Management. In this section, the authors look in some detail at a broad range of important management topics, or what could best be described as sub-systems of any total management system. The chapters on vegetables and plantation crops draw together material not readily available and so provide excellent references on topics seldom in-

cluded in books of this nature. In most of the other chapters, clear analyses on topics ranging from animal production, cropping, pastures, mixed farming, machinery, and accounts and records are presented.

Chapter 13 on animal production was disappointing because of the authors' reliance on the livestock month (LSM) approach to matching feed supply and stock demand for grazing animals. This approach ignores the fact that grazing animals are adapted to storing feed reserves on their back, and that supplementary feeding is only necessary for many classes of grazing animals when bodyweights drop to, or are close to, minimally acceptable levels. The chapter would have been improved by showing some typical bodyweight curves, how they vary with stocking rate and season and at what levels supplementary feeding becomes necessary. Readers could also have been encouraged to obtain similar curves from the numerous stocking rate experiments run throughout Australia in the last 20 years and relate the information to their own farms.

The final section of the book is entitled General Farm Economics and Management. An ambitiously diverse range of topics are covered in these nine chapters, including Marketing, Rural Policy, Farm Structure, Booms and Busts, Drought, Labour, Farm Finance, Taxation and the Futures Market. The reader who already has a basic knowledge in these topics will find most chapters of little use. However, for students who have never been introduced to them, they provide a necessary starting point. For instance, the chapter on Labour Management covers this important topic in seven pages and in a chatty style without any reference to the important research into labour management which has been carried out.

The Farming Game will appeal to a wide range of readers. Both students of farm management and farm managers will find it the best available general text produced in Australia. The intimate and sometimes humorous style of writing adds interest to some otherwise 'hard going' topics. However, one group of buyers it won't appeal to is people with poor eyesight, as the book is printed in a smaller type size than is normally seen.

ALAN BLACKBURN

*Marcus Oldham Farm
Management College,
Geelong, Victoria, 3221*

Managing The Farm Business. By S. B. HARSH, L. J. CONNOR and G. D. SCHWAB. (Prentice-Hall, Englewood Cliffs, New Jersey, 1981.) Pp. 384, ISBN 0 13 550376 0.

There is no evidence that these three authors from Michigan State University formed a committee to write *Managing the Farm Business*, but the text has certain features which are sometimes associated with such an organisational structure—uneven quality of content and moving in many different directions at once. Much of the book is very good, being useful and usable. Some of it is less so.

The authors have aimed to provide a basic text in farm management for undergraduates. The book consists of 16 chapters, divided into five parts. Three introductory chapters deal with management, information

in decision making and basic economic concepts. In Part 2, descriptive 'what is' parts of the farm story are investigated. Diagnostic analysis, 'what is wrong with the farm', is covered in Part 3. Farm planning, 'what would happen if', is dealt with in Part 4. In the final part, a prescriptive analysis, the authors emphasise the linkages between decision making, implementation and feedback.

The authors stress the flexibility with which the book can be used for teaching. They suggest that, for a two-part farm management course, the book can be split conveniently into Parts 1 to 3 and 4 to 5. The introductory part is lucid and stimulating. Parts 2 and 3 are devoted to the less exciting descriptive aspects of accounting systems and records. It is not until Part 4, the best of the book, that there is some scholarly and interesting applications of economics to some problems. Instructors who followed the authors' suggested teaching program may very well find that, in the second part of the course, they out-numbered their congregations.

In this book, topics such as production economics, planning, information, decision making, budgeting and specific applications of economic principles are covered—as any farm management book should do. The better parts of the book occur where the authors clearly address specific problems and diagnose, analyse and test solutions rigorously on the basis of specific principles. A systems approach to management is advocated. It is not altogether clear that a systems approach to farm management is significantly different from the less glamorously titled, traditional analytical approach, called farm management.

Decision problems concerning machinery are covered rather briefly, as are risk and uncertainty. Whole farm planning and linear programming are handled well. The treatment of investment analysis and capital budgeting is good, as far as it goes. The scant attention given to inflation in investment planning and capital budgeting is either a serious oversight or an expression of macroeconomic faith. A chapter is devoted to the crucial problems of capital, credit and leverage associated with growth of the farm-firm. Although, again, the treatment is brief, these are issues which often are inadequately dealt with in farm management textbooks.

Managing the Farm Business is largely free from the worst excesses of Americanisms and jargon, though swine herdsman (pig feeder?), taxmanship and postoptimality (sensitivity?) analysis would get a run in any jargoneer stakes.

With greater risk and uncertainty of production, and dependence on export markets, Australian agriculture is different from agriculture in the U.S.A. Whilst *Managing the Farm Business* is inappropriate to managing the Australian farm business and farm management teaching in many ways, good teachers making good use of the good bits may find it reasonably useful and, at \$28.00, reasonable value.

L. R. MALCOLM

*University of Melbourne,
Parkville, Victoria, 3052*

Agricultural Finance. By W. F. LEE, M. D. BOEHLJE, A. G. NELSON and W. G. MURRAY. (Iowa State University Press, Ames, 1980.) Pp. 437, ISBN 0 8138 0050 1.

This is the seventh edition of a book celebrating its fortieth anniversary. Michael Boehlje is an added co-author to mark the event.

Agricultural finance is the economic study of obtaining and using capital in agriculture. The book is divided into three parts, as was the sixth edition, to cover the subject matter of a topic which has become increasingly more important in agricultural policy and farm management. The present edition is better organised, has a wider scope and is more readable than the sixth edition.

Part I, the Principles of Agricultural Finance, is devoted to the principles and concepts of finance, including goals of financial management in a risk-return framework, concepts of capital allocation over time and procedures for analysing various investment options. The chapter, Theory of Financial Management, has been improved greatly and now introduces other important work in financial management and portfolio analysis.

In Part II, the Financial Management of the Farm Business, the authors apply the tools and concepts developed in Part I to making financial decisions in farm firms. This is achieved by an eight-chapter sequence devoted to topics such as controlling resources, financial analysis, estimating credit costs, repayment analysis and legal aspects of borrowing. There are two chapters on strategies for managing the increased risk brought about by the added use of borrowed funds in farming today. The part concludes with a two-chapter discussion on retirement and estate planning.

Material considered in Part II in the previous edition has been relegated, more appropriately, to either Part I or III. For example, the chapter on elementary farm management has been deleted and the relevant and condensed material presented under topics in two chapters of Part I. Similarly, material for loan applications is presented in a new chapter in Part III.

Chapter re-organisation in Part II has allowed the authors to expand the treatment of some topics and to introduce new material to the book. These modifications have overcome some of the deficiencies of the previous edition, albeit inadequately in some instances, such as the theory of decision making under risk.

In Part III, the Financial Markets and Agricultural Credit Institutions, the authors discuss the macroeconomic and institutional aspects of agricultural finance as they apply in the U.S.A. Two chapters in the sixth edition have been combined to form a chapter entitled Financial Markets and Policy. With some minor exceptions, the remainder of the part is similar to that of the sixth edition. The appendixes have not been revised and suffer the same deficiencies as the sixth edition.

The authors have captured some of the advances of agricultural finance, particularly the theory of credit management by the farm-firm, reported in the literature between the two editions. Readers familiar with the literature will detect these contributions, but will note also some obvious omissions.

The objectives of a text on agricultural finance should be, first, to develop the theory of agricultural finance so the reader can evaluate the investment, financing, repayment and consumption decisions of the farm-firm in keeping with an objective of long-run financial viability of the farm business; second, to allow the reader to become familiar with

the application of analytical techniques to a variety of problems in agricultural financial management; and third, to expose the reader to the institutional environment in which agricultural finance decisions are made. For Australian readers, the book goes a measure of the way to achieving the first objective, partly achieves the second, but not the third.

JOHN S. GROVES

*The Primary Industry
Association of Western Australia,
Perth, W.A. 6000*

Asian Village Economy at the Crossroads. By Y. HAYAMI and M. KIKUCHI. (University of Tokyo Press, Japan, 1981.) Pp. 275, ISBN 0 86008 287 3.

Hayami became well known for his international comparisons of agricultural productivity and his studies with Ruttan, both historical and contemporary, distinguishing 'land-enhancing' technical changes (for example, fertilisers and insecticides), especially attractive to countries such as Japan, and labour-enhancing technical changes (for example, most forms of equipment), especially attractive to countries such as the U.S.A.

In this interesting book, the picture of the Asian village economy, in general, is shown as one of increasing population pressing on a limited supply of land, with real wages approximately constant, and with an increasing proportion of the product accruing to land. There are important exceptions, however; these include Japan, Taiwan and South Korea. But in this book, based on detailed field studies, which never lose sight of economic analysis, Hayami and Kikuchi show what unexpectedly large differences may prevail, not only between nations, but also between villages only a few kilometres apart, apparently for reasons inherent in their social structure.

In the strife-ridden Central Luzon area of the Philippines, with many absentee-owned large estates, the former American administration tried to introduce land registration. This showed the best intentions and the worst results. Illiterates could not substantiate their claims against the larger proprietors. One village surveyed (where rice yields were high), was found to be moving toward 'polarization' between a few big farmers and a large landless proletariat. This, however, could *not* be attributed to any significant difference in technical or organisational productivity on the part of the larger farmers. The results found here can be generalised throughout Asia – the use of improved varieties of rice is found to be *not* a function of farm size. Other villages were found to be moving toward 'stratification' of peasant sub-classes based on tenancy and sub-tenancy. In this process, economic rent has been captured as a part of the mixed income of tenant farmers.

Land reform in the Philippines, long and successfully obstructed by influential politicians, has recently made some qualified progress. Without discussing the social and political desirability of land reform, there is also an economic case for it, if it can be shown that the larger farmers do not optimise their use of economic resources. This proposition has, however, been questioned by Ruttan and the authors seem

often to agree with him. They support Schultz's claim that Asian farmers, even though illiterate, do optimise the allocation of the scanty resources available to them, as against the rival theories of Lewis, Ranis and Fei, and others, who contend that wages and rents are well out of line with marginal productivities.

The authors also studied two adjacent villages in Indonesia. In one, real wages showed a small decline with an increasing share of the product going to rent. The daily rental of a buffalo was also increasing, but was only of the same order of magnitude as a man's wage. Buffaloes must be numerous, fodder relatively cheap, and the ploughing season not rushed, in contrast to the situation in India. In the technologically progressive village, on the other hand, the shift in the demand function for labour outpaced the supply shift, with consequent increases in both labour input and real wages.

The authors make an interesting theoretical commentary on government interventions, namely, that a minimum-wage law induces landowners to reduce their own direct cultivation and to make increasing use of tenancy, while maximum rent laws have the converse effect. Preferential granting of credit to small farmers, the authors consider justified economically as well as socially, because their supply of credit is almost always far below optimum and they can make very productive use of any further credit. In fact, however, most of such government-assisted credit is pre-empted by those who have 'pull'. Hayami and Kikuchi also argue that much more consideration should be given to land taxation by development planners. Land taxation is administratively much easier, and economically more effective, than 'land reform' as a means of reducing the disparity in income between landed and landless classes, and extracting funds for the development of agricultural technology and infrastructure.

Another potential source of resources to develop infrastructure is mobilising rural labour in idle seasons. This is an 'art' which has as yet been little studied. But, such labour will have to be paid more than a subsistence wage, as Raj has shown in India.

In Indonesia, and sometimes elsewhere, much harvest labour is engaged on the 'client' system, or customary social relations between the larger farmers and the poor of the village, although this is gradually giving place to direct labour contracts. As rice yields rise, the harvest workers are having to accept remuneration in kind of a smaller proportion of the harvest than was formerly customary, sometimes as high as one-fifth; and to harvest with a sickle instead of a hand-knife. In India, however, the situation is simpler. Wage work is the duty of the lower castes, and that is that.

COLIN CLARK

*University of Queensland,
St. Lucia, Qld 4067*

Log Pricing in Australia. Policies, Practices and Consequences. By R. N. BYRON and J. J. DOUGLAS. (BFE Press, Canberra, 1981.) Pp. 98, ISBN 0 9593620 0 2.

The authors of this report discuss briefly the concept of value and criteria for pricing logs and then review, in some detail, alternative

methods for valuing wood. These methods include the resource levy, residual value, cost of production and competitive bidding approaches. The residual value approach forms the basis for most of the analyses which follow and may be less familiar to readers of this *Journal* than the remainder. Based on the concept of derived demand, the residual value approach starts from the selling price of the processed product and deducts all relevant costs of production back to the standing tree (stumpage) stage. These costs include allowance for normal profit, a subject of much debate as to what constitutes an appropriate allowance. The residual value is then an approximation to the price which an entrepreneur should be able to offer for stumpage in a perfectly competitive market.

The authors calculate the residual values for major wood products, such as, export wood-chips, sawlogs and pulpwood for domestic consumption. These values are compared with the limited array of data available on actual prices received by the various state forest services, limited because such data are generally regarded as confidential by the services concerned. Actual prices tend to be substantially lower than the residual values, although the authors are careful to qualify these results. Nevertheless, the publication of the residual value calculations, and of actual prices, represents a notable advance because these values will provide a basis for comparison and refinement in the future.

The concluding chapter on distortions in wood pricing, is perhaps the least satisfactory section. It is rather disjointed and difficult to follow, and the authors hide their strongest results in Appendix D. These results are based on a simple theoretical analysis of demand and supply for sawlogs in which supply comprises a very responsive import sector and a constrained domestic sector.

The report is not well-written or structured and the inclusion of an Addenda which contains more recent information on actual prices is quite annoying. The marginal cost in writing these into the main text would not have been great and the marginal benefit considerable. Nevertheless, the authors deserve congratulations for their enterprise in undertaking a private publication.

On the other hand, one cannot help but question the utility of forest economics research in the BAE, where the authors were employed, if this type of research cannot be published under some official imprimatur. The research may not be especially innovative or deep, but it does represent an important initial step in opening up a controversial and little-known area for public scrutiny and debate. What better role for the BAE?

I. S. FERGUSON

*University of Melbourne,
Parkville, Victoria, 3052.*