BOOK REVIEWS

Agricultural Development: Soil, Food, People, Work

By Charles E. Kellog. Soil Science Society of America, Inc., Madison, Wisc. 233 pages. 1975. $8.75.

Several years ago I picked up a book published in 1941 to find out something about soils and land. The current volume, *Agricultural Development*, was written by the same author 34 years later. His experience and learning are evident.

Two themes run through the text:

> Without a good plan based on a study of the soils, water, and essential services, great delays and failures are inevitable.
>
> In fact, many of the greatest opportunities for increasing the world food supply and the incomes of farmers are reductions in wastes between the fields of standing crops and the kitchens.

The first theme concerns the proper use and care of the soil; the second involves development of an infrastructure for crop marketing. The market is the world, and the people considered are the technicians who work to improve agriculture in the less developed countries. The author does not describe their work so much as the problems they face, and he compiles a number of "do's" and "don'ts," mostly "don'ts," based on his own experience. As such, the book is almost required reading for anyone involved in foreign agriculture.

Despite its relative brevity, the book does not read quickly. One reason is that Kellog includes numerous sage observations; such as "here I am not arguing for that easy virtue of tolerance but for that far superior virtue of appreciation." It takes time to savor them properly. Also, he presents ideas in a highly compact style. At times, his book reads like an epitome, a concise digest of the subject matter. He covers a wide area, ranging from a discussion on clear-cutting to one of the Green Revolution, describing the latter in a third of a paragraph. We have all heard of soil erosion, but who is acquainted with the opposite condition, water logging? Kellog explains a subject for us often by approaching it from the aspects less readily known to the reader. The practical value of the book is tremendous, representing, as it does, a broad assessment of agricultural development in the less developed countries. And if Kellog doesn't discuss a matter himself, he refers to it and to a leading authority on the subject.

Kellog does seem overly optimistic, however, when he writes that potentially 1.8 billion hectares of arable soil can be added to the 1.4 billion currently in use. He mentions factors that would dilute or negate the value of the added land but does not seem to relate them. "The prospects of marketing some of these, especially tea, coffee, and some of the fibers, are questionable." What good does it do to raise more bananas if the market for them is already saturated? Kellog does not develop this. "The tourist assumes they [the workers] are lazy. But the tourist probably gets 3 to 4,000 calories a day, whereas the poor cultivator may not have more than one-half that." The lack of food and resulting lowered production, of course, represent a vicious cycle, which adding new land to cultivate would not remove.

If there is a weakness in the book, it is Kellog's all too frequent uncharitable references to "the very narrowly trained specialist" and "the ill prepared generalist," which seem to be his private euphemisms for incompetence. As a consequence he has set himself up as the primary authority, which of course he did not intend.

The only real flaw in the book is that the pictures were printed in black and white. Use of color photographs would have been a welcome addition.

Howard Christie

Today's Food Broker: Vital Link in the Distribution Cycle

By Daniel I. Padberg. Chain Store Publishing Corporation, 2 Park Avenue, New York, N.Y., 10016. 200 pages. 1971. $10.

Though ostensibly a book about food brokers, *Today's Food Broker* more properly describes food distribution. The beginning and ending chapters, which treat the broker directly, aptly picture the vital services such agents perform in bringing food from the manufacturer to the consumer. Padberg describes brokers as independent agents who do not take possession of the product but provide sales and merchandising services for the manufacturer throughout the distribution system. Other chapters in the book primarily consider food processing, marketing, the consumer, management, computer science, and the broker's function in each of these areas. The sections on rising income and its impact on the modern homemaker arouse interest.

Dr. Padberg's ability as a marketing man represents the main strength of the book. His precise, wide-ranging use of marketing terms in their proper context makes the material more readable. The frequent use of tables and statistical comparisons helps, but some of the indexes seem esoteric. Though the level of explanation is geared to the apprentice, those in food distribution for a number of years could also benefit from reading the book. Perhaps its main application, though, will be as supplementary reading in a marketing course.

The book provides useful history on the interplay of the components of food distribution and the broker's adaptation to changes over time. The reader comes to appreciate the importance of the broker function in food distribution to the point of wondering if wholesalers are needed. But one also wonders how the physical distribution is made after the broker has completed the sale and offered advice. An extensive list of both manufacturers' and food brokers' responsibilities in coordinating shipments and deliveries does not answer the question of how actual distribution is made.

Although the broker as an industrial entity, an impersonal link in the food distribution chain, is well defined, the broker as a human being is not. The reader looks for more observations like the one in which Padberg states that the senior members of a food broker firm will visit the wholesalers while the less experienced staff members visit the retailers. Some of the type of flavor supplied by Gerald Carson's drummer in *The Old Country Store*, a popular book, would have helped round out the picture of the food broker.

What future changes may occur in food distribution? Padberg puts forth at least one. In crowded metropolitan areas with numerous high rise apartments, there is little space for stores and parking lots. In such areas, shoppers could order and pay for food items by inserting punch cards into terminals. The goods would be promptly delivered to a receiving area in or near shoppers' homes.

Howard Christie

Water Rights Laws in the Nineteen Western States

By Wells A. Hutchins, completed by Harold H. Ellis and J. Peter DeBraal. Volume II. U.S. Department of Agriculture, Miscellaneous Publication No. 1206, U.S. Government Printing Office, Washington, D.C., 20402. 756 pages. 1974. $10.

When Wells A. Hutchins, longtime staff member of the U.S. Department of Agriculture, died on September 19, 1970, he was regarded as the foremost authority on water rights as they have evolved in the 19 Western States. He had written and spoken extensively about this subject, and his *Selected Problems in the Law of Water Rights in the West*, published in 1942, was quoted by Supreme Court justices along with the earlier legal authorities, Clesson S. Kinney and Samuel C. Wiel.

Twenty years ago Hutchins began a revision of *Selected Problems*, one that became the three-volume treatise that he had in preparation at the time of his death. Two of his departmental colleagues, Harold H. Ellis and J. Peter DeBraal, have undertaken to edit and complete the work. Volume I appeared in 1971 and it was reviewed in the January 1973 issue of this journal. Volume II is the subject of this review; the third, with an index, will follow.

The first volume treated State water policies, characteristics of watercourses, navigable waters, and the nature of the appropriative right. The second volume presents the nature of the riparian right west of the 98th meridian, and it describes the pueblo water right of California and New Mexico as well as the ancient water rights of Hawaii. Then it continues with a lengthy commentary on the protection, loss, adjudication, and administration of water rights in watercourses, reviews the law of diffused waters, and concludes with two chapters on rights in groundwater.

The 18 chapters on surface water rights are the product of a lifetime of research and study. The author relies on legislative statutes, constitutional provisions, and innumerable court decisions; occasionally, he refers to earlier treatises and journal articles. The result is the most complete and authoritative survey of Western surface water law in print.

Unfortunately, the same cannot be said of the two chapters on groundwater rights, one of which, chapter 19, was prepared by William M. Champion, professor of law at the University of Mississippi. Although chapter 19 was designed to be general, its surveys are brief, fragmentary, incomplete, and occasionally inaccurate. In a chapter of 33 pages, information concerning groundwater rights in 19 States is scattered under three headings and in some cases it is repeated in chapter 20. The review of States that have authorized the designation of critical groundwater areas omits four, including New Mexico, where the institution originated.

With respect to authenticity, Champion errs when he writes that the Arizona Supreme Court has "consistently held that percolating waters . . . belong to the owners of the soil" (p. 635); in its initial decision in *Bristor* v. *Cheatham*, the court opted for public ownership, but reversed itself in the second decision. The California court in the original decision in *Katz* v. *Walkinshaw* did not "clearly" (p. 635) reject the English rule. Quite to the contrary, Justice Jackson Temple went to great pains to point out that he was not radically departing from it. In a more serious mistake, Professor Champion declares that there is "no statutory law defining rights to the use of percolating ground water in Washington" (p. 652). The Washington legislature thirty years ago declared "all natural ground waters of the state . . . also all artificial ground waters . . . to be public ground waters and to belong to the public and to be subject to appropriation for beneficial use. . . ." (Washington, *Session Laws*, 1945, p. 827).

Chapter 20, "Ground Water Rights in Selected States," provides more accurate, detailed, and comprehensive descriptions, but for only 8 of the 19 States. It would have been preferable to have omitted chapter 19, enlarging chapter 20 to include comprehensive summaries of the groundwater laws in all 19 States. As it is, more complete surveys exist in the *Summary-Digest of State Water Laws* issued in 1973 by the National Water Commission.

Robert G. Dunbar

The Personal Distribution of Income and Wealth

Studies in Income and Wealth, edited by James D. Smith. National Bureau of Economic Research, Inc., 261 Madison Avenue, New York, 10016. Vol. 39. 568 pages. 1975. $17.50.

"Measurement without theory" is the syntactical pigeonhole into which many economists place National Bureau of Economic Research studies. Anyone of that opinion who fights his or her way through *The Personal Distribution of Income and Wealth* will have that bias reinforced.

Measurement is important for two reasons: to inform realistically and to promote or guide action. As a presentation of methodological techniques and accurate descriptions, the essays included are excellent. They present any interested reader with a solid base to begin analysis. But the lack of analysis *per se* in any of the essays or in the comments covering them is a maddening irritant; the reader is constantly left asking "so what?"

James D. Smith, the editor of the volume, is as guilty of this irritant as any of the other authors. In his essay with the scintillating title "White Wealth and Black people: The Distribution of Wealth in Washington, D.C., in 1967," Smith caps the estimates section with the following: "The data for nonblacks supports the contention that outliving one's spouse is the route to increased riches." He continues: "Among blacks, the marital-status differences in wealth nearly disappear," and concludes "Being black, as was apparent from the descriptive tabulations, is an important negative factor in wealth holding . . . . " We never would have guessed.

And then there's Boulding. While Kenneth Boulding provides the only easily readable essay of the group, the purpose of it seems to be to promote some of his other works, one of which he deigns to footnote (the other is his concept of the grants economy). But then Smith, in the introduction, told us that this essay is "characteristic Boulding."

One of Boulding's comments deserves to be challenged. He asserts that "we are apt to fall into an 'income prejudice' very similar to race prejudice. That is, we assume that because people are alike in one quality or measure, they are alike in others." This reviewer finds Boulding's intent rather curious and his comparison odious. Equal capacity for "enjoyment" is one of the basic premises of Western democracy; universal suffrage is rooted in the idea that every person has the equal capacity to enjoy a vote—and its consequences. If that be a "prejudice," it needs to be fostered.

The studies included in this volume will undoubtedly be presented in more depth by their authors at a later time. The casual reader might do well to wait until then to read them. Only the incurably curious researcher should approach this volume.

David R. Dyer

Spatial Sectoral Programming Models in Agriculture

By Earl O. Heady and Uma K. Srivastava. Iowa State University Press, Ames, Iowa. 484 pages. 1975. $12.95.

This book is essentially a synthesis of articles resulting from mathematical programming modeling work by Heady and his associates over the last 20 years. The modeling methodology employed is linear programming—with one exception, which involves the incorporation of linear demand equations in a quadratic programming formulation. The authors present a particular sequence of models to illustrate the systematic development of models from the more simplistic Heady-Egbert regional production adjustment model to much larger, sophisticated models. These larger models incorporate simultaneous interaction of many crop and livestock commodities, transportation, exports and imports, and policy actions; specification of farm size and soil conditions in a resource allocation framework; water resource use among competing agricultural and nonagricultural demands; and explicit consideration of optimal land use, water allocation, technological development, and soil conservation within certain environmental constraints.

The models are all massive in size, containing as many as 10,000 equations and 75,000 variables. Their size results from the inclusion of large numbers of producing regions (in some cases, one or two hundred) and a multitude of crop and livestock commodities. The authors conclude from working with such models that their size does not present much difficulty in a methodological or computational sense but mainly in the models' insatiable demand for data. This demand is currently a major stumbling block in applying this type of model to countries other than the United States, especially the underdeveloped nations.

The authors present well the objectives for building each model, the differences of each from previously constructed models, their mathematical structure, and the problems and techniques used to provide voluminous quantities of data. They describe in detail results from solving the models to analyze various policy considerations as well as the impact of changes in demand, technology, resources, and costs.

Nearly half of each chapter is devoted to analyzing particular solutions to the models. The treatment becomes quite laborious unless one is particularly interested in the specific question being addressed. Following a particular analysis becomes cumbersome unless the reader has convenient access to a microfilm viewer. Every one of the data tables has been placed on microfilm.

A major purpose of the book is to spur further use of mathematical models in other countries and more extensive development in the United States. However, a prerequisite for this type of model building overlooked by the authors is the training and development of the model builders. The book could have been much more useful to potential model builders if the senior author

had shared some of his experience and insights involving the model development process.

For example, some questions which go unanswered are: What type of analytical software system should be developed to facilitate such massive model structures? What are the tradeoffs between building simplistic, less costly models versus obtaining "realistic" results? What procedures should be used to properly validate models? What cost and resource requirements can be expected in building similar models? What aggregation problems should one expect to encounter and how might they be handled?

In short, the book provides an excellent inventory of what E. O. Heady and his associates have accomplished in the last 20 years, but it stimulates enough questions whose answers could fill another extremely useful book.

Hilarius W. Fuchs

World Food Problems and Prospects

By D. Gale Johnson. American Enterprise Institute for Public Policy Research, Washington, D.C. 83 pages. 1975. $3.

In this small volume, covering a wide spectrum of issues on the world food problem, Professor Johnson has provided a lucid layman's account of recent events on the world food scene and his personal views on prospects for the years ahead. He has seasoned his paper with references to many ERS reports.

A confluence of events brought about the crisis of 1973: the poor harvests of that year in several major producing regions, the USSR decision to go into the world grain market to make up its needs rather than absorb the shortages, the shortfall of the Peruvian anchovy catch, and increased affluence in many countries during the past decade that has brought a consequent upgrading of diets. But most of all, Johnson blames the sharp increase of grain prices on government policies which limited demand adjustment to shorter supplies to the price mechanism. While his analysis is appropriate for countries like the USSR, it is less appropriate for the poor in developing countries who would suffer further deprivations if their ration of grain were suddenly to cost substantially more. Johnson rejects the view that the affluent in some countries pose a threat to the poor in others because the well-to-do consume (directly and indirectly) a disproportionate share of the world's grain supplies.

"Are high farm prices here to stay?" Johnson asks. Citing data which indicate that there has been a long-term trend toward lower grain prices, he says he does not believe the events of 1973 signal a reversal of that trend. Here, Johnson differs from views of Lester Brown and Dale Hathaway, whom he cites in this respect. Johnson takes the position that while he believes farm prices will undoubtedly reflect higher land and input costs, including energy, he deprecates their impact. The *real* price of grains received by farmers will fall as supplies become more ample, he argues, naming the price declines of early 1975 as support.

Professor Johnson also tackles the question of grain reserves and examines the relationship between stocks and prices, citing ERS reports. A worldwide system of grain reserves is sought, he concluded, because governments do not permit free trade in grains and do not let market prices allocate world supplies. His observation is partially correct, but it fails to consider the concern of poor countries that they will be priced out of the market by the more affluent nations. Johnson does list three reasons why reserves might be useful for the United States: (1) to meet emergencies in developing countries; (2) to foster trade by helping convince importing countries of assured supplies; and (3) to absorb variations in commercial export demands—particularly if the Soviet Union continues to be an intermittant and large-scale importer.

In a wide-ranging chapter on increasing food production in the developing countries, Johnson says they have great potential for expanding food production. But he argues that the real issue is to increase per capita supplies significantly and that to achieve this goal population growth rates in these countries must be reduced. He points to the Middle East with its huge natural gas reserves as having a great potential for producing nitrogen fertilizer, the critical input to increase output. But the potential is being wasted (more natural gas is flared in the Middle East than is consumed by the entire petrochemical industry in the United States) because, he argues, peace and political stability are lacking. Hence, the large capital investments needed are not being made. It seems a little odd to the reviewer that with all the petrodollars now flowing into the region and the tremendous investments being made in countries like Iran and Saudi Arabia, that capital should be lacking for this rather obvious area of industrial development. This somewhat flawed argument appears as the lead paragraph of the press release by the American Enterprise Institute for Public Policy Research, publisher of the booklet.

The conditions necessary for increasing food production in developing countries are known, Johnson says, giving the following: more agricultural research; an adequate supply of modern inputs; improvement and expansion of irrigated areas; incentives to farmers to make the changes; and improvements in transportation, marketing, and processing institutions and facilities. But above all, Johnson concludes, it is not an absence of technology or know-how, but the uncertain commitment of governments, the lack of political will among the developing as well as the industrialized countries that threatens the prospects for increased per capita food supplies in developing countries. He fears that when world supplies become more ample, this year or next, the current mood of urgency will pass, as it did between 1969 and 1972. A more widely shared and substantially greater effort by all countries is needed—the Organization of Petroleum Exporting Countries as well as the Organization for Economic Cooperation and Development; the planned

and the market economy governments; and, most of all, the developing countries themselves. A failure to maintain the current momentum toward increased production would be a catastrophe for many millions of people.

Martin Kriesberg

Ohio Farmer

By Wheeler McMillen. Ohio State University Press, Columbus, Ohio, 43210. 220 pages. 1974. $11.

In No Time at All

By Carl Hamilton. Iowa State University Press, Ames, Iowa, 50010. 185 pages. 1974. $4.75.

When agricultural professionals like the authors of these two books write autobiographical accounts of farm life during their youth they do so within a frame of reference which makes their work particularly valuable. These two books, together with Henry C. Taylor's *Tarpleywick*, provide us with a century of coverage of midwestern farming. Taylor's book takes us from the settlement of Iowa in the 1840's to World War I; McMillen's book covers the period from 1890 to 1922; Hamilton's ranges from 1910 to 1940. All describe the period before the energy revolution took hold in American agriculture. Each family survived a severe depression. The first two families experienced periods of relative prosperity. The fact that no real prosperity existed in agriculture during the period covered by Hamilton may account for the generally depressing tone of his book. Near the end, he notes, "It has been said that at times a person of very ordinary wit can hardly avoid success, while contrarily, in other times and circumstances, a person of uncommon ability can not escape defeat." Hamilton's family lived precariously close to the line between success and defeat. After losing their farm in 1920, they lived on rented farms. Not until Hamilton's father reached retirement age had he accumulated the resources to buy another farm. By then it was too late. He was too old.

All three books abound in details describing various farm operations and family living. Many changes occurred over the years. Horse-drawn equipment improved and it became highly specialized. The railroad and the automobile arrived, creating marked changes in marketing and purchasing practices of farmers. Rural free delivery and the telephone helped to break down isolation. Farm credit developed. Science began to contribute to the art of farming. Yet H. C. Taylor's father would have been quite at home on a farm of the 1930's like the Hamilton's. And Thomas Jefferson would have been able to understand the Hamilton farm because farming still meant a way of life rather than a food factory. The authors deserve a vote of gratitude for having recorded this lifestyle in fascinating detail for future generations.

Jane M. Porter

Water Management and Agricultural Development

by Kenneth Frederick. The Johns Hopkins University Press, Baltimore, Md. 187 pages. $10.

Though Kenneth Frederick's focus is a small region in western Argentina, his findings and recommendations can be applied by persons interested in the optimal intertemporal use of many common property resources. Looked at another way, Frederick's focus is wide. He considers social, political, and economic implications of the water supply situation in Cuyo.

The economy of the Cuyo region is based on the production and processing of agricultural products, particularly grapes and wine, which account for 92 percent of Argentina's grape and wine production. Grapes account for 60 percent of Cuyo's cultivated land and 75 percent of the value of its agricultural production.

Until recently, Cuyo's supply of land and water resources was not recognized as a limiting factor to future growth. Land remains abundant but it must be irrigated for crop production. Surface water supplies fed primarily by snowmelt from the Andes Mountains and ground water pumping easily met the region's needs through the early 1960's. Since then, however, ground water pumping has exceeded normal recharge to Cuyo's aquifers. Major water infrastructure investments and a significant increase in the number of irrigation wells could not prevent substantial crop damage in the drought years of the late 1960's.

The short-term problems of 1967-72 subsided because of a doubling of the number of irrigation wells and unusually plentiful rain and river flows in 1972-73. But the longrun outlook has not changed. At one time surface water flows exceeded water use. Now, a farmer's surface water receipts are uncertain and generally insufficient for the minimum needs of land possessing legal rights to this water. Further, much of the region's agriculture depends on a diminishing supply of increasingly costly ground water.

Frederick's study focuses attention on evaluating water use efficiency under the impact of market forces and alternative government policies. While the public sector has become more actively involved since the onset of recent water shortages, it has not begun to address the long-term realities facing Cuyo's water resource.

The government response has been to enlarge the effective flow of surface water and to increase its reliability by investing in dams, canal lining, and irrigation wells. Pricing policies continue to understate the economic value of surface water. Real costs of ground water have been reduced by 50 percent or more for many farmers through subsidized agricultural credit policies, tax incentives for investing in ground water use, and favorable electric power rates. In addition, the local governments have quite successfully supported high wine prices in 1972 and 1973, thus encouraging private sector investments in the industry. Unfortunately, if recent upward trends in water use continue for another

decade, Cuyo's principal aquifers could be fully depleted shortly after the turn of the century.

Major changes will undoubtedly occur in water use patterns and economic growth by that time. They may result for several reasons, Frederick believes, including a natural reduction in supply, government controls limiting further expansion in use to protect current users, or efforts to alter current consumptive trends to promote more efficient water use. The author feels that the measures required to ensure such development are neither self-evident nor likely to be politically popular. Acceptance of a long-term policy will require marked efforts to educate vested interests that inefficient use will be detrimental to the whole region.

Recognizing the political climate, Frederick proposes a development strategy that would slow but not eliminate the excessively rapid use of ground water. It would provide greater incentive for more efficient use, but not eliminate the gap between private and public water costs. Incentives would be provided for improving the conjunctive use of ground and surface water. Measures proposed include (1) elimination of credit, tax, and power subsidies for ground water use; (2) increase in surface water costs; (3) establishment of a market on surface water; (4) research benefits and costs of new irrigation techniques; (5) a study of the merits of a user tax on ground water use; (6) establishment of a mechanism to develop and implement plans for improving the short- and long-run uses of water; and (7) strengthening of extension services to marginal farm operators.

John Sutton

Technology and Civic Life: Making and Implementing Development Decisions

By John D. Montgomery. The MIT Press, Cambridge, Mass. 239 pages. 1974. $12.50.

Those interested in and especially those involved in agricultural development in the Third World should read this book closely and at length on its systematic analysis and innovative proposals. Much of what Montgomery contributes seems to have come from the seminar on development administration he has taught at Harvard since 1962. For an interested outsider, like myself, his book is worth the price just for his review of the importance of technology in the development of Western political and economic systems, and his review and use of the abundant literature on nationbuilding.

Early in the book, Montgomery states one of his basic propositions: ". . . technology almost certainly offers the best hope of improving the quality of life in the developing countries." However, he is certainly not a technological determinist. Rather, his deep-seated anxiety is that technology, badly introduced into a Third World political culture, can be—indeed, sometimes has been—far more harmful than beneficial. The basic dilemma, then; how can modern technology be introduced into these new nations in ways which will induce and nourish the growth of a civic life both culturally and materially satisfying to the individual citizen? And, it should be quickly noted, Montgomery is not concerned only, or mainly, with the few—the elites; his principal concern is with the peasants, the urban laborers and their families—". . . the planned use of technology to serve the ideals of social justice."

Political science and economics receive a few hard knocks from the author. They are too elitist, more concerned with legislatures and bureaucracies than with those people who are presumably the legislator's constituents. And the two disciplines are too much entranced with the beauty and intricacies of macroeconomics rather than the grass roots significance of micropolitics. Anthropology, social psychology, sociology (to a lesser degree), and the experimental side of the behavioral sciences have more to offer people who are involved in development politics and administration, in the author's judgment.

Montgomery believes it quite likely that the Third World (and perhaps the First and surely the Second Worlds, too) has been overly committed to national planning, with its emphasis on coercion rather than personal participation in decision formulation and policy administration. National planning is necessary, he argues, but so is "local option" and "individual choice." Technological change is both necessary and dangerous. It may destroy the old world while creating a new world which will soon prove to be far more unattractive and demeaning to the ordinary citizen than was his or her traditional environment and culture. Montgomery seems convinced that these real dangers can be overcome if Third World governments accept as their central, guiding proposition that "*modernizing the behavior of citizens could be taken as a primary task of development administration*" (his emphasis).

The richness and breadth of the author's presentation are probably impossible to summarize, but I will cite a few examples. "Modern" behavior requires a new "rationality"; not necessarily the Western definition, however, because ". . . rationality itself is a convention." However, there are patterns of developmental behavior which will have to be culturally modified before change can be induced into the particular political culture. That is, new standards will have to be understood and adopted (regular work hours, for example). Personal investments will need to be specified and made (in education for example). Civic institutions will need to be built that are sensitive to the root causes of conflict and can develop conflict-resolving processes which provide both equity and legitimacy of rule to all the citizenry. Finally, the leadership must be found to provide the inspiration, intelligence, integrity, and skills to bring all these changes about.

To word Montgomery's major propositions in these terms, however, seems to understate his hardheaded idealism. He presents a valuable discussion of a four-sided conflict typology (product competition, process competition, intrasectoral or class conflict, and conflict with social values) and he comments on the importance of diffusion projects and the diffusion process. His discussion of the "analytical dimensions of technology systems" (size, shape, intensity, and time) also impresses the reader. Perhaps his most important contribution, at least to this reviewer, appears in the last chapter, on decisions. He discusses three types: first-order decisions (a systematic comparison of the social significance of proposed technological changes), second-order decisions ("which agency should receive the assignment to implement a new program?"), and third-order decisions (the analysis of incentive policies). These three types make up the real business of administration, the true test as to whether things will move and measurable change actually take place.

Certainly, there is room for doubt and worry about some of Montgomery's ideas. He seems to be expecting more from the Third World than the Western nations have been able to learn and practice, assuming that it would be wise for them to do so. He observes that a "systems approach [his approach] to the uses of technology calls for the integration of science, politics, and welfare factors with engineering and economics, specifically addressed at the country level." There is the real problem of "technologic misfit," to be sure, yet one wonders: might not a fair amount of this kind of misfit be preferable to even a benevolent application of such a systems approach? Moreover, one can be attracted to his discussion of and stress on the equity and efficacy of citizen participation. Yet how do such value propositions square with his judgment that "the ultimate sources of developmental change are nearly always provided by elites . . ."?

Nevertheless, this review must close on a positive note and a well-intentioned plea. Agricultural scientists can learn much from a careful reading of this study. If the Third World nations must learn, in very large part, how to feed themselves, Montgomery's basic themes should be given the most thoughtful consideration. Perhaps the new nations will find ways to adopt technology while minimizing its evils so that a democratic civic life can be gradually constructed, or where one already exists, preserved.

Ross B. Talbot

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