BOOK REVIEWS / COMPTES RENDUS

Food Energy in Tropical Ecosystems
Edited by Dorothy J. Cattle and Karl H. Schwerin
New York, New York: Gordon and Breach, 1985. (Food and Nutrition in History and Anthropology Series, Volume 4). xxiv + 290 pp. Maps, charts, illus., references, index. $55.00

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This volume is based on a panel symposium presented at the 1980 annual meeting of the American Anthropological Association. The original panel papers occupy the first two of four sections of papers, and pertain to the field of "nutritional anthropology", a fairly recent mixture of anthropological studies of subsistence, field ethnography on food habits, and nutritional science. The reviewer served as one of two discussants for the panel, so this is his second round. He is pleased to report that the original group of papers has been revised and improved, although basic difficulties with their logic and methodology, which the reviewer criticized on the occasion of the panel, remain largely unchanged.

The title of the volume is misleading, since the most frequent theme of the papers is social change and economic development as a factor in diet and nutrition (the principal point of criticism made by the reviewer in his role as discussant was the limited use of this theme, and he is therefore gratified to note that somebody was listening!) There is no really hard measurement of "food energy" in any paper, only indirect assessments at best; and there is certainly no analysis of "ecosystems" in the technical sense of the word. The overall impression given by the book is eclectic, with little or no integration of themes and concepts across the papers. The book contains some interesting information on tropical foods and their production and changes, but it is incidental and episodic. In the honest opinion of this reviewer, the book is hardly worth the astonishing price of $55.

There are four sets of papers: the first, "Dietary Staples", consists of revised versions of two of the original panel papers, one, by Darna Dufour dealing with manioc; the other, by Peter Kunstadter, with rice. Aside from this concern with staples, the papers share nothing in common as to method or theory. The second group, also consisting of panel papers, has four contributions by E. A. Berlin, E. N. Anderson, C. Wilson, and K. G. Dewey, grouped under the title, "Subsistence Strategy". However, there is no definition of this term nor do the papers share common methods and concepts. The third section is called "Adaptation to Ecosystems", and consists of three papers by A. and P. Fleuret, M. McCutcheon, and R. R. Thaman and P. M. Thomas, reprinted from other sources or recruited for the book. These three papers are useful descriptive, narrative, more or less "geographical" accounts of crops and adaptive change in two Pacific islands and one African locus. The final section, "Afterwords" consists of two papers, one by Antoinette Brown entitled "The Tropics and Nutrition"; the other, by one of the editors, Karl Schwerin, called "Food Crops in the Tropics". These two papers are really general introductions and should have been placed first, not last. The roster of "tropical ecosystems" included

in the book is limited, and there is no attempt to define systematically different types of ecosystems or to relate the papers to such a classification. Two or three pages in Schwerin's piece seem to attempt a review of the papers, but mainly in the context of animal protein resources. However, there can be no real analysis of this latter topic since all of the authors are concerned mainly with vegetable crops and only mention animal protein sources in passing. There is a brief introduction by Angela Little which lists seven key questions in the field of "food science and technology" as applied to "nonindustrialized populations living in tropical ecosystems", most of which are only marginally or anecdotally dealt with in the papers that follow. We have become inured to this kind of disparateness and poor integration in symposia based on panels, but this seems an especially serious case.

Despite the disjointed character of the book, there is much of interest of a factual nature. Those papers which seem to present either useful information, or are constructed with an especially sound protocol of relating data to aims are the following: Kunstadter's piece on rice in a northern Thai community; Christine Wilson's general paper on staples and calories in Southeast Asian diets; Eugene Anderson's portrayal of Chinese and Malay subsistence patterns in Penang; the three papers in Part III, as already noted; and Schwerin's descriptive review of crops and foods.

The remainder of this review will consist of detailed critiques of three papers—one by a nutritional scientist (Dewey) and two by anthropologists (Dufour and Anderson) which contain serious methodological problems, especially relevant for the field of nutritional anthropology.

As noted, a process examined or referred to in at least seven of the eleven papers in the volume concerns the effects of modernization on diet. The results, if we can go by these papers, are mixed: in some cases the consequences are deleterious to dietary diversity and quality; in other cases, subsistence production is sustained, or even reasserts itself in the midst of the shift to cash economy, market crops, and store-bought foods. It seems to depend on the nature of the crops, the "culture", and on the passage of time. In general, there seems no doubt that in at least the early stages of transition to the production of cash crops, foodstuffs produced by families with substantial home garden plots, or hunting and gathering activities, become less diverse. Processed foods, sugar, etc, increase in the diet. There is sufficient documentation of this process in the general literature on the Third World to accept it as common. However, it does seem to have a historical dimension; that is, it may well be an early effect, and as the paper by Kunstadter shows, a reversion to home-produced foods may occur later in the process. Alternatively, as the paper by A. & P. Fleuret shows, cash cropping in other settings may have little or no impact.

A paper by Kathryn Dewey, a nutritionist, on the nutritional consequences of a shift to commercial agriculture in a region of Tabasco, Mexico (reprinted from *Human Ecology*; not presented at the meeting) has some ambiguous aspects which exemplify the difficulties in handling dietary change. The region is also affected by intensive oil production, but the study is concerned exclusively with the possible dietary effects resulting from a shift from partial subsistence to cash cropping. Dewey used a sample of 149 preschool children, subjecting them to a standard battery of physiological and somatic tests and measurements designed to measure nutritional effects. She selected children from families that fell into two categories—those who maintained a "a certain degree of self-sufficiency in food through subsis-

tence production'' (p. 113) and those who no longer do so. She immediately acknowledges, however, that this cannot be used as a before-after sampling, since ''all'' families have been affected by the social and economic changes in the region. The point is that there is not nor has there ever been ''pure'' subsistence production in Tabasco; there have always been various degrees, with variability in families' reliance on production for the market.

The findings on nutritional effects are entirely statistical: several hypotheses about causation are related mathematically to the body measurement data from the child sample, and the results, while hedged, seem to ''imply that families in the study who have maintained a greater degree of self-sufficiency are better off nutritionally . . .'' (p. 124). Sugar consumption is a key variable—''there is a significant negative correlation between sugar consumption and height, even when other variables that might influence height are controlled for''(p. 126). Economic variables are examined with reference to the possible effect of rising income: she found that increased income does not mean that nutritional status increases; none of the correlations are statistically significant. She also remarks that there were so few families with significantly higher income that the findings may be meaningless (p. 130).

There is more, but these notes on her findings may serve to provide a basis for discussion. The basic problem is that there is no *direct* physiological demonstration that dietary changes have measurable effects on children: the analysis is entirely statistical; only tendencies are found in the form of correlations of greater or lesser significance. This would mean that in a group of children from families relying on a bought diet, there will be some children who show the expected physical effects and some that do not. So, statistical tendencies aside, why do some children escape the effects? Because their families compensate for dietary deficiencies in some way? Limit candy consumption? Beg, borrow or steal home-produced foods? No information relating to this variation is presented. She acknowledges, properly, that families cannot be separated—''impossible'' (p. 140)—into subsistence and commercial farmers, hence she has only averaged statistical tendencies. Within this vague and contaminated sample, the better method would have been to do ethnography on food habits: examine family food habits to see how in particular cases reliance on cash actually influenced the habits. The reviewer is profoundly skeptical of this type of nutritional survey research, done at one time, and totally neglecting variation, temporal dimensions, and particular stages or phases of a regional socioeconomic change process. There is also no possible way of determining that commercial agriculture is the villain, since the region has been extensively affected by industrial production as well. She cannot distinguish between the two sets of influences, since she reports no data on precisely how particular families responded to particular types of changes—cash cropping, wage labour, media, etc.

With respect to the problem of the relationship of commercial cropping to diet and nutrition, one suspects that the underlying issues are economic, and pertain to the nature of the crop. The paper by A. and P. Fleuret indicates that bananas remain important in East Africa even in areas where extensive commercial agriculture has taken hold—possibly because they have commercial as well as subsistence value. In the Tabasco case, the impact may well have been greater, because the subsistence regime was mainly swidden, based on crops with no commercial significance. Likewise, in the Thai village discussed by Kunstadter, rice continues or resurges as a

staple subsistence food because it has dual importance. The same holds true for cassava in the Pacific, as detailed in the Thaman and Thomas paper. None of these studies, except Kunstadter's, really do the preliminary institutional (economic, etc.) analysis necessary to set the subsistence *vs.* commercial change in proper perspective.

The short-term-study method which is traditional in field ethnography is used in most of these papers, and the financial and temporal exigencies of fieldwork being what they are, one suspects there is not much one can do about it. However, it is apparent that those papers in the book which represent continuous or repeated observations over long periods of time stand out as superior in depth of judgement; in a nutshell, they suggest that if a sufficiently long period of time is given to the study, one tends to find that human groups balance out dietary biases or labor and energy biases in the production sphere. An example of a *short*-term study—four families over a single month of observation—is anthropologist Darna Dufour's account of manioc production in an Amazonian village. Manioc provides most of the calories, she finds, and women do most of the work on manioc. She notes that men focus on "local fish and animal populations"; such foods are important because of their "nutrient density and high protein quality". However, there is no nutritional or labor-time analysis of the contribution of this men-gathered subsistence to parallel the manioc calorie analysis. Her major point is that women work harder than men to produce calories, but in the absence of a companion study of the men's contribution the findings are impossible to evaluate. The original version of the paper, as read at the meeting, had a feminist orientation: somehow the fact that women worked harder to produce calories was evidence of something or other, perhaps exploitation. In the published version, this bias has been partially corrected or at least acknowledged, by noting, in the last sentence of the paper: "Second, the maintenance of stable energy flow by women allows men considerable flexibility in their time-energy budgets, a flexibility which is critical to the exploitation of available animal protein resources" (p. 18). Where is the evidence for this assertion? In addition, fluctuation in manioc supply or processing, due to any number of factors—shortage of women or manioc, modernization effects, etc, would mean that the men's contribution would loom even larger. But this cannot be determined in one month, with only four families as a sample. I do not mean to cast doubt on the specific findings respecting female work on manioc processing, but, without the parallel information on the men's contribution on the non-calorie side, this study has no discernible point.

The paper by anthropologist Eugene Anderson is a good example of the mixture of insight and bias which characterizes some papers and other literature in the nutritional anthropology field. In a sense, there is an urge to have one's cake and eat it too (all puns excused). Step by step: first, Anderson's paper makes some excellent points: he shows how two very different "food systems"—the Malay and the Chinese—exist side by side, and provide their eaters with adequate diets, but have differing implications for long-range dietary viability and resource conservation. This is precisely what food anthropologists ought to do. But this apparently doesn't satisfy, because Anderson takes one more step: he evaluates certain aspects of the diet in terms of scientific nutritional standards, e.g., "However, the large amounts of lard, white flour and sugar in the Chinese diet are at best of dubious value" (pp. 93-94), and these, he continues, are the foods which were introduced in the course of

"modernization". He notes they can be expected to increase in use as modernization progresses, etc.

Again, in one sense this is true and important. However, there are two problems: first, as other papers in the volume attest, traditional subsistence-oriented and desirable food habits can be sustained or can reassert themselves in the midst of modernization, supplementing or ameliorating the effects of modernization; i.e., intake of these "modern" processed foods can persist or increase but their bad (?) effects can be neutralized. The second issue is the use of Western nutritional standards to judge any article of diet, whatever its source, as good or bad. As Angela Little notes in the Introduction (p. xvii), we tend to judge diets nutritionally on the basis of the use of foods in our own Western diet. Is this what Anderson is doing? Probably, but the reviewer should note that the descriptive contributions of his paper tend to outweigh his possible confusion on nutritional standards; i.e., his demonstration that the cultural and economic factors behind the Malay systems are not trivial, but rooted in the institutional patterns of Malay society, minority group status, etc.

Since the majority of papers deal with staples in the form of vegetable crops, there are two categories of foods which are conspicuously neglected in the papers: those regularly used foods with animal protein; and secondary foods of all kinds, snacks, weeds, gifts, vegetable and animal. This neglect is so obvious that it probably explains Schwerin's final paper, where he does his best to pick out of the papers the few references to these non-staple foods in order to set them against the predominant emphasis on staple vegetable foods. As he notes (p. 258), "Our authors have made no attempt to be exhaustive, thus we can expect even greater diversity exists in the local food systems than is documented here". This seems a most kindly acknowledgement of the fact that a book with the resounding general title of this one really does not provide a single detailed analysis of a *whole* diet for anyone.

The issue is this: when one is dealing with these part-subsistence, part market-oriented rural economies, the standards of nutritional analysis used in the Western urban world simply cannot be used with any confidence. Particular intakes of staples may be high or low, but the corresponding fluctuation in incidental and supplementary foods of all kinds will tend to obviate simple conclusions about nutritional adequacy. This lesson was learned a long time ago; it is surprising that so little was done with it in the papers in the volume that represent field studies of diet. Thus Schwerin feels impelled to make up the difference in part by raising the issue and doing his best to provide generalized information.

We are left in some confusion. If the diets of most human groups tend to fluctuate, with stages and stases, and a tendency to move toward a reasonably adequate nutritional level, then what precisely is the role of the expert? Certainly his data and conclusions, drawn from single, synchronic studies, is not much to go on. Nutritional standards, originally felt by anthropologists to be "hard", and offering something better than soft cultural preference standards, have turned out to be extraordinarily slippery, limited by samples, time, and technical difficulties. Energy intake and output have proven resistive to fieldwork.

Where does this leave us? Back where we were in the late 1940s: with the study of *food habits* as the one distinctive contribution anthropologists can make to human diet (e.g Montgomery and Bennett 1979:124-144). How is food produced or acquired, what are the culturally-defined preferences; what potential foods in the environment are neglected because of preferences; how do preferences change and

why? Elements of these queries are present in the papers in this volume, but no single paper provides a detailed description of a complete dietary; hence the ambiguities and omissions. There are of course some gains from using the nutritional approach: one is the use of a simple method of measuring intake, namely, weighing particular foods over a period of time, which is used by those few papers which aim at some sort of analysis, and this is better than attempts at determining actual nutrient content, which has not proven feasible. However, anthropologists need not replicate nutritional analysis; they have their own specialties. There is no substitute for good ethnography on the cultural meaning of food and food preferences, which should not be diluted by chasing after presumably hard data on nutrition and food chemistry, or resorting to generalized geographical descriptions.

References

Montgomery E. and J.W. Bennett
1979 Anthropological Studies of Food and Nutrition. *In* The Uses of Anthropology. Edited by W. Goldschmidt. Washington: American Anthropological Association.

The Nuer Conquest: The Structure and Development of an Expansionist System
Raymond C. Kelly
Ann Arbor, Michigan: The University of Michigan Press, 1985. viii + 320 pp.
Maps, Bibliography. Distributed in Canada by John Wiley and Sons. $39.50 (cloth); $17.95 (paper).

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Kelly undertakes an unusual task for African ethnology, the application of a cybernetic analysis, in the tradition of Rappaport, to the Nuer. The question which guides his analysis is "How can we explain the fact that the Nuer, an offshoot of the Dinka and culturally like them, expanded between the years 1818 and 1890 from an area of 8,700 square miles to 35,000 square miles, in the course of which they overran large parts of Dinka and Anuak territory?" Rejecting what he documents as the usual explanation made by such people as Evans-Pritchard and Sahlins, population pressure, he details the differences in the Nuer and Dinka systems, such as the structure of bridewealth distribution, livestock management practices, herd structures, population densities, and others. He develops a cybernetic model showing how the interaction of these variables produced a negative feedback process among Nuer which led to increasing expansion, whereas the Dinka system remained stable. Furthermore, he points to the root cause of this expansion in Nuer ideas of what the ideal bridewealth should be—a cultural cause.

Kelly is to be congratulated for using an approach which takes ethnological analysis in Africa to a higher level than usual, because he attempts to define variables and assess their dynamic impact. Dynamics, in the sense in which the term is used in analytical science, is not one of anthropology's long suits. Think of Almagor's (1978) typical and static analysis of the Dassanetch system as compared to Carr's (1977) social geographic analysis of the same system as it reacted over