

BOOK REVIEW

The Ethnobotany of Southern Balochistan, Pakistan, with Particular Reference to Medicinal Plants. Steven M. Goodman and Abdul Ghafoor. Chicago, Illinois: Field Museum of Natural History. Fieldiana, Botany, New Series, No. 31, 1992. Pp. v; 84. (\$20.00) (paperbound). ISSN 0015-0746.

This book is a compendium of ethnobotanical and medicinal knowledge of the Baloch people of the Balochistan Province of southwestern Pakistan. Steven Goodman, a field biologist at the Field Museum of Natural History, and Abdul Ghafoor, a botany professor at the University of Karachi in Pakistan, travelled around this arid expanse of desert and mountains, by foot and by four-wheel-drive vehicle for four months to undertake this study. They interviewed nomads and villagers about their ethnobotanical knowledge, and traditional healers about all aspects of their application of herbal medicines, following Unani and Ayurvedic medicine systems. Despite the inevitable influences of "modernization," healing traditions in the region remain viable.

Following a brief introductory section, describing the project, the state of ethnobotanical knowledge, the settings of the study, and the general format, the book is divided into two major parts. Part 1, *Ethnobotanical Uses of Wild Plants*, includes a total of 114 plants in 43 families having local usage. For each species, the family and scientific names, voucher specimen number, locality, and vernacular name are provided, along with notes on use, treatment (for medicine) and, often, comments relating to the plant and its history. Part 2, *The Pharmacopoeia of Balochistan Herbalists*, begins with a brief summary of the Unani and Ayurvedic Systems of medicine, followed by a description of the herbalists and herbal doctors consulted, and the interviewing methodology. It then comprises a systematic list of herbal medicine plants, totalling 56 plant species in 33 families, in a similar format to the plant of Part 1.

This is a useful compendium of information, and it will serve as a good foundation for comparative research, as well as representing a valuable reference for the ethnobotany of a little known area. The index of local names will make the information accessible to local botanists, healers and others as well, as long as they can read English. The book contains a number of excellent black and white photographs of the places and people, and a few of the plants; more illustrations would have made it more useable for local people. Perhaps it can serve as a basic source of information for a more "user-friendly" local ethnobotanical guide.

Nancy J. Turner
Environmental Studies Program
University of Victoria
Victoria, British Columbia
Canada V8W 2Y2

- VAVILOV, N. I. 1926. Studies on the origin of cultivated plants. *Bulletin of Applied Botany* 16:139-248.
- VIDAL, JULES. 1959. Noms vernaculaires de plantes en usage au Laos. *Bulletin de l'Ecole Française d'Extrême-Orient* 49(2):435-603.
- WESTER, L. and D. CHUENSANGUAN-SAT. 1994. Adoption and abandonment of Southeast Asian food plants. *Journal of Home and Consumer Horticulture* 1:83-92.
- WORKS, MARTHA A. 1990. Dooryard gardens in Moyobamba, Peru. *Focus* 40:12-17.
- YONGVANIT, S., T. HOM-NGERT and K. KAMONPAN. 1990. Homegardens in Dong Mun National Forest Reserve: A case study from Ban Na Kam Noi, Kalasin Province. Pp. 53-76 *in: Voices from the Field*. C. Carpenter and J. Fox (editor). East West Center, Honolulu, HI.

BOOK REVIEW

Edible Wild Plants of Sub-Saharan Africa: An Annotated Checklist, Emphasizing the Woodland and Savanna Floras of Eastern and Southern Africa, Including Plants Utilized for Food by Chimpanzees and Baboons. Charles R. Peters, Eileen M. O'Brien, and Robert B. Drummond. Kew, England: The Royal Botanic Gardens, 1992. Pp. 239. £15.00 (paperback). ISBN 0-947643-51-6.

As its title reveals, this is not a book, but a check list of wild edible plants—and a very specialized one at that, drawn from an unsystematically narrow literature that reflects more the life experiences of the authors than a guided intellectual inquiry (with some exceptions).

The 3-page introduction outlines the broad history of the authors' study of wild plants since its inception in the 1970s. The 200-page list of plants follows, and is divided into the major plant groupings: I. Pteridophyta, II. Spermatophyta, A. Gymnospermae, B. Angiospermae, 1. Monocotyledons, 2. Dicotyledons. Families and genera are arranged alphabetically within these groups. A short list of references is followed by an index to families and genera.

Building on their initial goal to synthesize information on indigenous wild food plants of Africa, Peters, O'Brien, and Drummond later broadened their perspective to embrace ecological and conservation issues, and eventually were drawn to other consumers of these foods—most prominently nonhuman primates. Finally, they fixed on chimpanzees and baboons in southern and eastern Africa since these primates eat some of the same plants that local peoples do and so are regarded as "pests" and "competitors" (p. 1).

The authors emphasize eastern and southern Africa, and for humans, consult some West African references as well. Each entry in the plant list contains updated botanical nomenclature, and synonyms when those appeared in the cited reference(s). Annotation is generally limited to noting what plant part is used, and who consumes it—H, C, and B denote the reported consumption by humans, chimpanzees, and baboons, respectively. In this context it is interesting to call attention to a growing body of related, and more sophisticated studies that reveal that some of what used to be regarded as primate "feeding" behaviors are instead intentionally medicinal, cosmetic, and otherwise different from food acquisition. I mention this here to encourage a broader sphere of inquiry, not to diminish the list, which still serves its purpose as a document of "consumption."

In addition to nomenclature and use, a few additional remarks are scattered among the entries—e.g., directions to use a young plant, or to consume a plant raw, and qualifiers such as “slightly toxic,” “famine food,” “pepper substitute.” Whether an entry is so embellished depends entirely on whether the reference(s) cited contained such detail. The result is that the individual plant records are uneven, a fact that distracts but also does not diminish the list.

The authors caution that, although “the identity of plants was checked as far as possible” (p. 3), botanical identification cannot be certain for records not backed up by voucher specimens. This statement reveals a sensitivity to the critical importance of vouchers for all studies involving plants (these preserve the identity of the plant in question and provide the only irrefutable link between local knowledge and bioscientific paradigms). Paradoxically, the statement also compounds whatever problems may be embedded in the references that lack vouchers. This problem is by no means unique to these authors, and I believe that it seriously compromises their work. Further, they (as others commonly do) miss the related problem that many researchers do not pay attention to the variability of common names for the same botanical species. Instead, they rely on the vernacular used in one village to identify plants by the vouchers that were collected in another location, where at least some of the common names are likely to be different: variability in local names occurs across space—even within villages and households—and over time.

That many of the references consulted are more than 20 years old raises an important issue. What has this to do with *contemporary* plant use, especially since the authors identify as one potential audience of this book “those whose job it is to set priorities for genetic preservation” (p. 1). Finally, scholars of human-plant relations in Africa, and generally, will note serious omissions among the references cited.

Overall, one could say that the authors achieved their goal—a synthesis, but one bearing some of the blemishes of the literature it cites. The list serves a rather specialized audience; researchers who work with these plants, and in these parts of Africa, will want to consult it for insights they may garner as they reflect on their own work, and should urge their institutional library to order a copy.

The production quality of the book is very good, and is reflected in its cost.

Nina L. Etkin
Department of Anthropology
University of Hawaii
Honolulu, Hawaii 96822

- . 1980. Death Valley Indian farming. *Journal of California and Great Basin Anthropology* 2:269–272.
- WILKE, PHILIP J., MARY DEDECKER, and LAWRENCE E. DAWSON. 1979. *Dicoria canescens* T. & G., an aboriginal food plant of the arid west. *Journal of California and Great Basin Anthropology* 1:188–192.
- WILKE, PHILIP J., THOMAS W. WITAKER, and EUGENE HATTORI. 1977. Prehistoric squash (*Cucurbita pepo* L.) from the Salton Basin. *Journal of California Anthropology* 4:55–59.
- YOHE, ROBERT M. II and SHARYNN-MARIE VALDEZ. 1993. The results of archaeological test excavations at the Breakfast Canyon rockshelters, Death Valley National Monument, Inyo County, California. Manuscript on file, Eastern Archaeological Information Center, University of California, Riverside.
- ZIGMOND, MAURICE L. 1981. *Kawaiisu Ethnobotany*. University of Utah Press, Salt Lake City.

BOOK REVIEW

The Nature of Shamanism: Substance and Function of a Religious Metaphor.

Michael Ripinsky-Naxon. Albany: State University of New York Press, 1993. \$57.50 (hardcover); \$18.95 (softcover). Pp. xii; 292. ISBN 0-7914-1385-3 (hardcover), 0-7914-1361-1 (softcover).

This volume synthesizes a wide-ranging literature in seven languages on shamanism, incorporating with it the author's own experiences and perspectives. It can be read as an introduction to the subject. Two of the seven chapters focus on the ethnobotanical dimension of shamanism, enough coverage to justify a book review for this journal.

Professor Ripinsky-Naxon views shamanism as a manifestation of the universal human quest to make larger sense of the relationship among the humans, natural forces and the unseen world. Ethnographic data, archaeological finds, past events, mythologies of the ancients and Jungian psychology are interwoven into a cultural-historical framework in which consciousness and intentionality are viewed as growing out of the collective unconscious.

Shamans have cross-culturally manifested similar kinds of reactions to outside forces and natural phenomena. An example would be the ability to trigger altered states of consciousness with quartz crystals and gold (which may have led them to become objects of human value in the first place). Also described are phosphenes—luminous images caused by excitation of the retina—that predisposed certain individuals in very different parts of the world to tie them to visionary experiences.

Ripinsky-Naxon is convinced that use of entheogenic substances, which he prefers to call hallucinogens, forms a pattern of great antiquity and centrality. Here he stands at odds with the historian of religions, Mircea Eliade, who for most of his life viewed the use of hallucinogens as an aberrant and recent innovation in culture history. The author avers that psychotropic plants were an early and major vehicle for achieving an altered state of consciousness. Shamanic use of mind-expanding substances can be inferred from cave art as far back as the Upper Paleolithic. Shamanic residues are apparent in complex religious systems as diverse as the Osiris cult of the ancient Egyptians, the animal-headed St.

Christophoros in Greek Orthodoxy, and Sufism. To appreciate how far thinking has developed along these lines, it is instructive to contrast this work with such classic treatises on primitive religion as Lowie (1925) and Radin (1937), neither of whom had a clue that hallucinogens could have broad explanatory significance.

Ripinsky-Naxon's cultural-historical speculations about certain psychotropic plants are as stimulating as some of them are tenuous. He posits the idea that Old World cereal cultivation originated to assure a ready supply of the fungus ergot (*Claviceps* spp.), which sometimes forms on the spike, rather than for the food value of the grain. Ergot in the eastern Mediterranean region was used, in addition to its therapeutic value, to induce visions. Building on Wasson's work on Siberia and India, fly-agaric mushroom (*Amanita muscaria*) is inferred to be a shamanic inebriant in Zoroastrian, Chinese and Ancient Greek traditions as well as in the Americas. On the basis of phytomorphic mushrooms on a Mochica ceramic, the author concludes that fly-agaric was ingested in this pre-Inca culture of Peru. Elsewhere in the Andean realm, mastication of coca (*Erythroxylum* spp.) leaves is said to induce divine trance. If so, it would have occurred through the power of suggestion of a sacred plant, rather than from the biochemical power of the alkaloids in the dried leaf. Curious assertions that coca chewing is of Chibchan origin and that cultivation of this plant started in the Bolivian Yungas are far off the mark both in terms of time and place.

Ethnobotanical details are not the strength of this book. Its forte emerges when the reader moves beyond the factual and verifiable into the dimly perceived origins of religious transcendence. The numinous quality of the writing encourages one to reflect on the deeper meanings of the religious impulse, linkages between nature and culture, and the psychic unity of humankind. One inescapable conclusion derived from this work is relevant to the present dominant mindset in Western, especially North American, society. Is not the war against drugs in reality a war against both the biological nature of human beings and an important aspect of their creativity? Specialists and non-specialists with ethnobotanical interests willing to focus on the big picture will find here much to think about. The clear prose, free of convolutions and abstract logic, facilitates the effort.

LITERATURE CITED

LOWIE, ROBERT H. 1925. Primitive Religion. Routledge, London.

RADIN, PAUL. 1937. Primitive Religion: Its Nature and Origin. Viking Press, New York.

Daniel W. Gade
Department of Geography
University of Vermont
Burlington, Vermont 05405

BOOK REVIEWS

Advances in New Crops. Jules Janick and James E. Simon (editors). Portland, Oregon: Timber Press. 1990. Pp. 582. \$65.00. ISBN 088192-166-1.

New Crops. Jules Janick and James E. Simon (editors). New York: John E. Wiley & Sons, Inc. 1993. Pp. 710. \$89.95. ISBN 0-471-59374.

The two editors of these extremely useful and outstanding volumes suggest that they be reviewed together. And I must fully agree with them. As a long-time economic botanist, I cannot recall any two volumes more needed and destined to fulfill more usefulness than these, unless it be Sturtevant's *Notes on Edible Plants*, restricted to edible plants and now for many years unavailable.

The earlier volume is the result of the First National Symposium of New Crops held in 1988. It is a compendium of many of the papers presented in that symposium, comprising 432 contributors. The aim of this volume—"to provide a national forum for leading authorities from industry, government, agricultural experiment stations and academia to discuss new crops"—has been most admirably attained in the papers from invited speakers, papers derived from many posters and abstracts of the remaining poster presentations.

The volume is summed up with an extraordinary complete index.

The second of these two volumes, an outgrowth of the Second National Symposium of New Crops—with 242 contributors—is made up of three parts: I. *Policy and Programmes*. (Policy, International Developments, Regional Development, Centres). II. *Research and Development*. (Exploration, Biotechnology, Cereals and Pseudocereals, Grain Legumes, Oil Seeds, Industrial Crops, Fibre Crops, Aromatic Spices, Medicinal and Others). III. *Paths towards Commercialisation*. (Industry, Outlook, Commercialisation).

There follows a most detailed and useful Index to Species Crops and Crop Products, with scientific and common names of the plants discussed and an Index to Authors.

The editors are to be highly complimented for their expert and logical arrangement of the many, often diverse, topics making up the 582 pages in *Advances in New Crops* and the 710 pages in *New Crops*.

Both editors are Professors of Horticulture at Purdue University. Dr. Janick has also taught at the University of London and the University of Hawaii.

Both of these two volumes belong on the shelf of every economic botanist, ethnobotanist and agricultural specialist and can be of immense value to numerous researchers in other tangential fields such as environmentalists, ecologists, plant historians, anthropologists, sociologists, economists and numerous governmental and international organisations charged with improvement of agriculture and other aspects of human welfare. In addition, they should be easily available to students in various diverse fields because of the vast amount of

information which is difficult to find elsewhere without an extraordinary investment of time.

Richard Evans Schultes
Botanical Museum of Harvard University
Cambridge, Massachusetts 02138, U.S.A.

Footprints of the Forest: Ka'apor Ethnobotany—The Historical Ecology of Plant Utilization by an Amazonian People. William Balée. New York: Columbia University Press, 1993. Pp. xvii, 396. Price not given. ISBN 0-231-07484-0

The Ka'apor live on an indigenous reserve clinging to the boundaries of the States of Para and Maranhao in Eastern Brazil. Their name comes from *Ka'a* for "forest," and the contracted form of *pipor* for "footprints," an appropriate name indeed for a people whose millennial presence in Amazonia has left an indelible mark on their surroundings. An even more appropriate name for a book that documents in impressive and meticulous detail the historical ecological processes that characterize ancient interactions between an indigenous people and their environment. With *Footprints*, Balée, whose research with the Ka'apor and other related Tupi-Guarani-speaking groups has spanned a decade, aims "to present a treatise that may rank among the most exhaustive English-language accounts of the ethnobotany of any indigenous people in Amazonia" (p. ix).

This is not, however, a book of long, boring plant lists. The unconventional concept of "activity contexts" is introduced to link plants with Ka'apor hunting, fishing, swidden gardening, gathering, food preparation, manufacture and repair of material goods, and other activities. By so doing, Balée tries "to convey the rich interweavings of human and plant that jointly produce both society and landscape" (p. 5). This is not to say that ample scientific data are not provided to support these human/nature links. In fact, *Footprints* represents a new genre of ethnobiological treatise, in the company of Philippe Descola's *In the Society of Nature* (Cambridge Press, 1994), that weds good anthropology with good science.

Balée's dissection of Ka'apor historical ecology begins with linguistic data showing the development of ecological terms in Proto-Tupi, the 2,000 year old reconstructed parent language of modern Tupi-speaking groups. Names for traditional domesticates had higher rates of retention than nondomesticates, showing that some modern groups actually lost much of their horticultural tradition ("agricultural regression") although terms for cultivars remain in the oral tradition. This is a reminder that indigenous groups as they appear today have changed drastically since "contact" with the White Man. It is also a reminder that "natural" landscapes of today may well be artifacts of historical agricultural activities.

This approach provides a diachronic optic to ecosystem transformation and the "anthropic disturbances" that have molded them. Perhaps Balée's most remarkable finding is that Ka'apor agroforestry practices can actually enhance regional biodiversity. This is drastically different from the destructive human forces at work in the rest of Amazonia. Data are provided to compare old fallows with high forests, as well as "indicator species" for human impacted forest sites.

Appendices in *Footprints* practically form a scientific treatise in themselves, with data on ecological and utilitarian values of the broad range of plant species and families characteristic of Ka'apor landscapes, plants from "dooryard gardens," dangerous and avoided plants, and medicinal categories.

Balée argues for a comparative ethnobotany that relates transformations between agriculture and foraging/trekking groups in Amazonia: a botanically-based scientific yardstick to characterize the ecological, economic, and social adaptations that indigenous peoples have made to survive in tropical forests. This would recognize the role of semidomesticated species and replace a simple monolineal evolutionary model with one in which change is a see-saw of survival strategies. A comparative ethnobotany would, indeed, provide an important option for ethnology, which to date has utilized a paradigm based almost solely upon comparisons of social structure and political organization.

Some gigantic problems thwart this comparative model: there are few researchers adequately trained in ethnobiology and financed to carry out the necessary research, and the number of indigenous groups who are allowed to continue their traditional agroforestry systems decreases by the day. The very existence of the Ka'apor, for example, is being threatened by a virtual invasion of timber-cutters, miners, and ranchers. As Balée notes in his Preface: "[This study] may soon become an example of a kind of anthropological study no longer achievable and a record of a kind of human-ecological relationship that has disappeared." This is the stuff of which discontent by politicized indigenous leaders for scientists is made: do the best scientific intentions, finest research, and brilliant treatises ever benefit their subjects of intellectual intrigue? Ultimately a book like this will be hailed by scientists as a pioneering volume, but will it leave a Footprint in our own forest of published works leading towards survival of those indigenous peoples whose knowledge form the priceless treasures of a shrinking Planet?

Darrell A. Posey
Oxford Centre for the Environment, Ethics, and Society
Mansfield College
Oxford University
Oxford OX1 3TF
U.K.

In the Society of Nature: A Native Ecology in Amazonia. Philippe Descola. Translated from the French by Nora Scott. Maison des Sciences de l'Homme and Cambridge University Press, 1994. Pp. xviii, 372. Price BP45.00 (hard-back) ISBN 0 521 41103-3 [Originally published in French as *La nature domestique. Symbolisme et praxis dans l'écologie des Achuar*, Editions de la Maison des Sciences de l'Homme, 1986].

Philippe Descola is undoubtedly one of the most eclectic and creative thinkers in anthropology today. In *The Society of Nature: A Native Ecology in Amazonia*, he skillfully weaves technical and conceptual determinations into a brilliantly readable monograph on the Achuar Indians of the Peruvian/Ecuadorian border

region of the Upper Amazon. The only problem with this publication is that it was not translated and published in English immediately after the original French edition appeared in 1986.

The Achuar, a relatively isolated bloc of 4,500 individuals, are one of the four dialect groups that compose the Jivaroan linguistic family. Descola describes their settlement patterns as "residential atomism" tempered by a supralocal structure called an "endogamous nexus." Their autodenomination is "achu shuar" (the people of the aguaje palm—*Mauritia flexuosa*), which is a dead giveaway that their identity is in large part defined by what we would call the "natural world" that encompasses them. There are intricate links between the physical landscape and the cosmic order, between terrestrial water and celestial rainfall, between heavenly bodies and earthly activities. Descola found that the Achuar "do not spontaneously comment on the organization of their cosmos, unlike other Amazonian societies, in which philosophical questions on the origin and meaning of the universe seem to comprise the main matter of daily palavers" (p. 63). Nonetheless, discernable spatio-temporal coordinates can be elicited, such as astronomical and climatic cycles, seasonal periodicity of various types of natural resources, landmark systems, and the organization of the universe into layers as defined in mythic thought.

The book integrates measurable scientific evidence for observable phenomena (for example, soil classification, diet, time-motion studies, plant lists, game captures) with ceremonial, mythic, and shamanistic practice and thought. It is made obvious that the Achuar do not see the supernatural as a level of reality separate from nature, since humankind is governed by the same laws as plants, animals, and even meteors that have souls and life. In fact, in mythical times nature's beings even had human forms that can still be encountered during soul journeys. Thus, as Descola points out (pp. 100–101) "the perceptible universe is seen by the Achuar as a many-sided continuum, now transparent, now opaque, now eloquent, now dumb, depending on the mode of apprehension chosen." The Achuar house is taken as an example. It is a structure whose architecture, building materials and construction can be described. But a house is much more than a shelter to the Indians: it is a unit of social relations and a passageway to the sky and netherworld. And just as it is impossible to separate the cosmic dimensions for daily life, it is meaningless to deny the symbolic significance of the dwelling. The Shuar, like all traditional peoples of Amazonia, do not just live in nature, they live with it and are a part of it: it is an extension of their own being no less than kin and ancestors.

Descola does justice to his chosen title for this book (although the original French title gives another nuance: "La nature domestique") by guiding his readers, most of whom come from the disjointed and dysfunctional societies that separate humans from nature, along the holist path that he himself took to get a glimpse of the Achuar World.

Darrell A. Posey
Oxford Centre for the Environment, Ethics, and Society
Mansfield College
Oxford University
Oxford OX1 3TF
U.K.

El Juego de la Supervivencia: Un Manual para la Investigación Etnoecológica en Latinoamérica (The Game of Survival: A Manual for Ethnoecological Research in Latin America). Victor M. Toledo. Berkeley, CA: Consorcio Latinoamericano sobre Agroecología y Desarrollo. 1991. Pp. 76. No price given (paperback).

Since the 1970's, Mexican ecologist Victor Toledo has been laying the groundwork for an integrated field of study called ethnoecology. He may not have coined the term, but his vision is original. This work is a useful summary of his many articles and books on how Latin American peasants classify and manage diverse aspects of the natural environment. Early in the text, he explains that the perspective of most ethnobotanical studies is limited because: (1) they focus on the study of traditional knowledge without considering its role in basic productive activities, that is, they separate culture from production; (2) they place the emphasis on analyzing single domains of folk knowledge—such as plants, animals, climates, and systems of nomenclature—neglecting to generate a holistic vision that integrates these dimensions; and (3) they concentrate on the empirical side of folk knowledge, excluding symbolic and other interpretive approaches.

This handbook, Toledo's remedy to past limitations, is divided into three parts. The first is an overall review of the field, including an extensive description of Toledo's typology of peasant ecological knowledge. The second part, which focuses on ethnoecological research in Latin America, presents information on ecological zones and indigenous groups; it is followed by a reading list of 34 critical papers on the ethnoecology of diverse regions and peoples. The third section is a short essay that explores the relationship between ethnoecology and another growing field, agroecology.

Although called a manual, this text reads more like an annotated course outline on the theory and practice of ethnoecology. This is not surprising, because Toledo states in the prologue that the ideas come primarily from courses he taught at the University of California at Berkeley and the Universidad Nacional Autónoma de México in 1988 and 1989.

This is an armchair manual, useful for helping us think about ethnoecological research, and for gaining access to the growing literature on the subject. As our field grows, the typologies devised to explain the relationships among all its subfields become increasingly complex. Toledo's is an endpoint in this evolution: a three-dimensional model that incorporates environmental, cognitive, and spatial aspects. I found it useful for classifying the different sorts of articles that fall within the scope of ethnobiology, but its practicality in organizing field research is questionable.

In fact, readers who are looking for a manual on how to carry out field studies may be somewhat deceived by the subtitle of this work. The closest that Toledo comes to methodology is in a section called "How to carry out an ethnoecological study" (pp. 40–44), but even here he limits himself to a rather philosophical discussion of how to get down to work.

While well-written, the book was produced inexpensively and shows a lack of editing. The illustrations are hard to read in places, and, beginning with the table of contents, we see evidence of incomplete formatting on the word pro-

cessor. These minor deficiencies in no way affect its utility as a text, and I highly recommend it for those looking for a primer on ethnoecology, especially as it is viewed from a Latin American perspective.

Inside the front cover, the sponsor of this paperback, CLADES, (Latin American Consortium for Agroecology and Development), is described as an umbrella organization for 11 nonprofit groups from eight South American countries. It is noted that copies of the manual are available from: CLADES; Casilla 97, Correo 9; Santiago, Chile.

Gary J. Martin
Anthropology Department
University of California
Berkeley, CA 94720

Life Cycles: Reflections of an Evolutionary Biologist. John Tyler Bonner. Princeton, New Jersey: Princeton University Press. 1993. Pp. vii, 209. \$19.95. (hardcover). ISBN 0-691-03319-6 (Cloth), 0-091-08494-7 (paper).

Although the varied reflections Bonner writes about in this book are interesting and at times entertaining, none of them deals with or addresses the topic of greatest interest to the readers of this journal—ethnobiology. As a past editor of this journal and as a frequent participant in the annual conferences of the Society of Ethnobiology, I have had ample opportunity to observe what ethnobiologists consider to fall within the realm of their discipline. The interactions and interrelationships of people with plants or animals, especially in a cultural or community setting, is the major theme in all the papers and presentations I have read, heard, assigned to students, written or edited during my years as a career ethnobiologist. The final two chapters of *Life Cycles* are entitled "Becoming Social" and "Becoming Cultural." "Ah," I thought, "ethnobiology at last." Wrong! Wrong, since these chapters deal mostly with the evolution of social insects, behavior in animals, division of labor, etc., with brief discussions of the social and cultural aspects of our species, *Homo sapiens*, e.g., the early development of writing, followed by the pencil, steel pen, typewriter, computer, Xerox copier and the Fax machine.

The targeted readership of *Life Cycles* appears to be those with a general interest in science and biology. Since I, like all ethnobiologists, am such a person, I found much to engage me in reading this slender and, in my view somewhat over-priced, book (no photographs; 24 black and white illustrations). It was a pleasure to note that some of Bonner's reflections are similar to those I had early in my academic career when I taught Botany 2—Survey of the Plant Kingdom—in the 1960s. And I always enjoy a different perspective, small or large, on topics over which I have reflected.

The book is organized into three unequal sections: The Background; The Period of Size Increase; and The Adult Period. In each section Bonner reflects upon the various ways different evolutionary lines have taken in achieving a particular end. For example, there have been several evolutionary pathways by

which organisms have become multicellular and thus larger, several pathways have led to autotrophy, behavior has had many different origins, and many factors may have led to the development of large brains in, for example, dolphins and humans.

To the extent that Bonner writes of how he became involved in the study of biology in general and the slime molds in particular, *Life Cycles* has autobiographical underpinnings. Ideas and discussions are grounded not only in Bonner's many years of professional research with slime molds but also in the research and viewpoints of early and contemporary developmental and evolutionary biologists. The interests of these biologists range from organisms as taxonomically diverse as algae and amoebae, to flowering plants, bees, birds, wolves, and primates including humans. Specialities within these taxonomic categories range from morphogenesis, to resource acquisition, reproductive strategies, imprinting, communication and language.

Bonner makes an interesting point which I would like to see incorporated into ethnobiological theory and practice: organisms should be viewed as the life cycles that they are and not just as, usually, the conspicuous, obvious stage. For example, how often do we automatically consider the gametophytes or for that matter, seeds, as part of the entire organism of higher plants? Thus, a sugar maple tree is much more than the biomass of mostly wood standing in, say, woodlots in Brown County, Indiana or bordering the streets and avenues of small cities such as Carthage, Missouri.

So, although *Life Cycles* does not address any of the numerous aspects of ethnobiology *per se* and is not a reference work, it does offer and integrates information and ideas of how the diversity of life evolved. Bonner presents rather technical material lucidly so this is a book that can be enjoyed by those who, although perhaps biologically untrained, like intellectual stimulation. Thus this book will make a fine gift for an aspiring biologist or for anyone who likes to explore new and fascinating topics.

Willard Van Asdall, Past Editor
Journal of Ethnobiology
4479 N. Summer Set Loop
Tucson, Arizona 85715.

Native American Cultural Resource Studies at Yucca Mountain, Nevada. Richard Stoffle, David Halmo, John Olmsted and Michael Evans. Ann Arbor, Michigan: Institute for Social Research, The University of Michigan. 1990. \$15.00 (paperbound) Pp. 232. ISBN 0-87944-328-6.

In 1982, the United States Nuclear Waste Policy Act proposed a plan to select safe disposal sites for high-level radioactive waste on the basis of both environmental and cultural investigations. Following a national search, three sites were recommended for further consideration. The first of these candidate sites to be studied was that at Yucca Mountain, Nevada, an area which is of great cultural significance to three Native American ethnic groups: Owens Valley Paiute, South-

ern Paiute and Western Shoshone. Significantly, the environmental impact assessment required an investigation of potentially vulnerable Native American cultural resources, the findings of which have been published in a series of reports.

This monograph essentially presents a summary of the total published data, collected throughout 1987 and 1988 by both social and biological scientists as well as by indigenous experts from 16 local tribes. The report is divided into six chapters which introduce the historical and current cultural significance of the site, and set out qualitative descriptions of the traditional archaeological and biological resources associated with the area. These chapters are followed by a series of appendices which describe the research methods used, regulations for implementation and possible actions of the U.S. Department of Energy, as well as photographs of Native American collaborators and 17 pages of bibliographic details. Unfortunately, while the table of contents is detailed, there is no index to this report.

The first three chapters, Introduction, Interpreting cultural resources, and Ethnohistory of Native American peoples in the Yucca Mountain region, provide an insight into the traditional subsistence and cultural activities of the Paiute and Shoshone peoples, and describe the legal background and methodological rationale behind the study. In addition, Chapter 2 specifically highlights intercultural differences in the interpretation of a given site or resource, thus illustrating the vital importance of native collaboration in impact assessment. The following chapters, Spatial analysis of Native American cultural resources, Ethnographic summary of Native American plant use, and Native American recommendations, present the major findings of the study based on data drawn from indigenous knowledge, historical documents and archaeological data. Patterns of resource use are discussed in relation to the spatial arrangement of peoples and resources, and a wide variety of plant resources with utilitarian or religious significance are described, including *Juniperus osteosperma* which is still of considerable ceremonial importance. The final chapter lists a series of recommendations made by tribal leaders regarding the conservation of sacred areas, cultural artifacts (including Native American petroglyphs and burials), and biological resources used in subsistence, material culture and ceremonial life.

In conclusion, while it is not clear from the report how the findings are likely to influence a decision regarding the siting of the proposed waste facility, the report does note that in some cases, evidence provided by Native Americans on archaeological sites has proved permissible in federal courts. It also illustrates a number of key issues of particular relevance to modern ethnobotanical studies, including the distribution of knowledge between groups and individuals, and the need for researchers to return details of their findings to native collaborators. Perhaps most significantly, the monograph highlights the practical application of ethnobotanical studies in environmental impact assessment, an application which should set an important precedent for future development projects throughout the world.

Cath Cotton
Biological Sciences, Whiteland's College,
RIHE, West Hill, London, SW15 3SN, UK