portion of "folk systematics." Finally, the authors have taken advantage of voluminous material to illustrate principles of naming and organization which, in line with recent speculation by the writers (particularly Berlin) and others, they suggest applies universally to ethnobiological (if not wider ethnoscientific) classification in general.

Truly the wealth of botanical and linguistic detail in the volume is impressive. The book overflows with photographs and beautiful line drawings, detailed lists of plant names and descriptions, tables of alternate Tzeltal forms for naming and describing plants, plant parts, and plant attributes, and index and cross-index to suit every taste. As a result, the volume would doubtless meet the authors' standards as a field guide for someone with a modest competence in botanical terminology. Moreover, there are presumably enough data here to enable interested Western botanists to come to understand and appreciate Tzeltal ethnobotany as a detailed and principled "alternative analysis" of a certain range of facts about the plant world.

The authors' suggestions about possibly universal features of classificatory terminology, though far from conclusive, are persuasively argued and illustrated in detail. Berlin *et al.* propose, for example, a division of plant-name lexemes based on productivity and simplicity, and they relate that division to a rough measure of cultural significance. They find, not surprisingly, that highly significant plants are likely to have simple, unanalyzable names, whereas less significant ones are more likely to have more complex and more transparent labels. These and similar observations at last lend genuine substance to the familiar principle that lexical diversification and elaboration invade areas of cultural importance.

There is, unfortunately, something rigid, unproductive, and sterile about the cognitive emphasis in this treatment of ethnobotany. The authors began with the premise that primitive man enjoys an intimate and vital relationship with the plant world. In the book, however, the relationship never blossoms. There is more to the cultural significance of plants than the fact that some are cultivated, others protected, others merely used. Plants are also revered, treated with respect, fear, caution. The relationship is affective as well as cognitive; Tzeltal speakers know about plants, but they also feel about them. It is true that "the variety of food types that can be prepared from corn and beans is . . . rather spectacular" (p. 113). But there is more to this spectacular variety than can be captured by a single list of different "food-types"; different foods are appropriate to different occasions and seasons, valued for virtues medical as well as culinary. Such facts are surely part of Tzeltal ethnobotany. The ethnocentric lapse that allowed the authors to claim of a particular corn drink that its taste is "not notably pleasant" (p. 114) is hard to reconcile with the lack of any account of native tastes, any explanation for the fact that Tzeltales prize the drink. An account of the forces—political, social, and ecological—at work in determining the constantly shifting economics of agriculture for Chiapas Indians is lacking; in its place is a rather lame, out-of-date list of rough market prices for Tenejapa produce. These are symptoms of the authors' failure to represent the fact that highland Chiapas Indians not only know a good deal about the world of plants but also live in that world; and that their world is changing, in ominous ways shrinking.

The authors' selective concerns may have led them to stress certain facts of Tzeltal plant knowledge and to omit others. And, as it is, the collaborative effort represented in this book spanned more than a decade and included dozens of researchers in addition to the three authors. But what we are left with is a rather laundered set of lists, an encyclopedic but unidimensional ethnographic notebook, rather than a more global picture of the interaction between man and plant in highland Chiapas.

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Archeology of New York

Aboriginal Settlement Patterns in the Northeast. WILLIAM A. RITCHIE and ROBERT E. FUNK. New York State Museum and Science Service, Albany, 1973. x, 378 pp., illus. Paper, $4.50. New York State Museum and Science Service Memoir 20.

For as much as 130 years, archeologists in New York State have been in the forefront of American archeologists in terms of data production, and, indeed, many of the type cultures of the northeastern United States and southeastern Canadian areas were first named and described by New York State archeologists. For example, the widely used term "Archaic" to denote a cultural stage characterized by band-level foragers, sans pottery, dwelling in a remote age (more remote than could then generally be believed), was first used in its modern sense to describe a particular New York State culture (the Lamoka culture) by the senior author of this volume in 1932. Much of this evidence-oriented work has been supported by the New York State Museum and its active line of State Archaeologists. Arthur C. Parker, who took the title in 1906 and was himself a Seneca, set up what must surely be one of the first anthropological dioramas of excellence. His Iroquoian scenes (still at the New York State Museum) were notable in part because he used life casts of actual Iroquois.

Aboriginal Settlement Patterns in the Northeast rather explicitly consists, as any such work ought, of separate sections presenting respectively the theoretical position of the authors, the archeological data used, and the resulting models of prehistory. As one would expect in a work on this area, the volume of data is quite impressive.

The book consists of chapters on the major prehistoric cultural stages of New York State (not the whole Northeast): Paleo-Indian, Archaic, Transitional, and Early, Middle, and Late Woodland. Specialists will note the use of the Transitional as a stage (all cultures are of course in a state of transition, and some northeastern scholars prefer to regard the manifestations in question as part of the Late Archaic) and the lack of data for discussion of separate Early, Middle, and Late Archaic substages. For each stage there is a meticulous, generally complete description of a major site or sites excavated by the authors. Interestingly, the authors use one such site for each of their first four major periods (for the first 10,000 years), two sites for the roughly 1000-year Middle Woodland, and eight sites for those final 500 years of prehistory in New York State, the Late Woodland. This disproportion results in part from the bias of available archeological evidence. It is less real than apparent, however, because the authors draw upon the great wealth of existing data (as summarized in figure 1, p. iv), largely from Ritchie's *Archaeology of New York State* (1969) and Funk's as yet unpublished "An Archaic Framework for the Hudson Valley," and so are able to discourse upon

a plethora of (for example) later Archaic cultures. Thus, this book represents an extension of the senior author's major contributions, and the new, vital input of ten years' work by his colleague and successor as State Archaeologist. (Although the book is dated 1973 and was released in early 1974, the writing was completed in 1971.)

For all but the Northeast specialist the book stands quite well on its own, by virtue of its straightforward presentation of major sites and the brief holistic summary it gives. Perhaps a certain imperial attitude on the part of the authors may be forgiven, for both of them have elsewhere demonstrated an exceptional grasp (and proper crediting) of the literature and of archeological materials and they have often "said it first" in their region. Moreover, because of the remarkable diversity of habitat that New York State encompasses (ocean coast, large rivers, interior mountains, interior lakes and marshes, Great Lakes plains and shoreline) their summation well represents much of the Northeast.

The general reader, as well as the specialist, will appreciate the many well-chosen and (with a few exceptions) nicely reproduced illustrations of sites, artifacts, chronological relationships, and settlement patterns. The general reader will also enjoy the portion of the book in which models of prehistory are presented. For example, he may well be unaware of the beautifully revealed overwhelming evidence for the in situ development of the Iroquois. *Zea mays* was introduced to New York State about A.D. 1000, and it, in concert with other factors of lesser importance, caused a population growth, village agglutination, the rise of internecine warfare, and apparently the change from male-oriented societies to matrilineal, matrilocal societies. This fundamental transformation of the proto-Iroquois in economy, ethos, and society was accomplished within a few centuries. The "League of the Iroquois" is probably best understood as a response to new trade relationships engendered by European contact. We can but wonder what unique political systems the late prehistoric peoples of New York State might have generated had that European inoculation not taken place.

It is in this concluding "Interpretations" section that the sweep of this major sample of New World prehistory is most evident. The highlights are in the discussions of the Paleo-Indian, Late Archaic, and Late Woodland stages. Although a lack of evidence precludes extended discussion of the Early Archaic, there are, in contrast, new materials or conceptions pertaining to the Transitional and the Middle Woodland, both of which are periods of interesting change in the aboriginal cultural history of New York State.

Aboriginal Settlement Patterns does suffer, to my mind, from two problems. The first, no doubt resulting from the coauthorship, is a fragmentation of presentation, which, however, pertains mostly to writing styles and not so much to data or interpretation. The second deficiency is the brevity of the explicit discourse on theoretical matters. As succinct as the authors are in their "General Considerations," three pages are insufficient. Obviously, both authors utilize the most recent of the tangible paradigms of settlement and subsistence analysis. Equally, they are particularly sensitive to time, both stratigraphic and cultural. One hungers for explicit discussions of these paradigms (about which other archeologists only seem to theorize without practical outcome).

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Plant Development

Basic Mechanisms in Plant Morphogenesis. Proceedings of a symposium, Upton, N.Y., June 1973. Biology Department, Brookhaven National Laboratory, Upton, N.Y., 1974 (available as BNL 50410 from National Technical Information Service, Springfield, Va.). viii, 430 pp., illus. Paper, $10. Brookhaven Symposia in Biology, No. 25.

The central problem in the study of morphogenesis, what causes differences to arise in cells of identical genetic constitution, is probably the same for all organisms. But although DNA seems to be the unique and universal ultimate genetic material of cells, and although the information encoded in DNA seems to be universally expressed through a similar complex of processes eventuating in synthesis of new proteins, there are many divergences among organisms along the way to the differentiated state. For example, regulation by induction-repression type mechanisms is very well worked out for several prokaryotic organisms, but the general applicability of this type of control to eukaryotes requires considerable additional documentation.

In the world of eukaryotes, plants differ markedly from animals in general developmental pattern. In their terminal and lateral meristems, plants retain active embryo-like centers of cell division throughout their life history. This makes their form much more plastic than that of animals and more susceptible to external regulatory influences throughout the life cycle. Experimentally, plants have the unique advantage that single cells of certain species can be propagated on totally synthetic media; they first form undifferentiated callus cultures, which then, at the experimenter's will, may be caused to differentiate formed organs, leading to an entire plant. This proves beyond any reasonable doubt that cells of the differentiated plant body retain the total genetic message for that species. But one can go even further. The walls of some plant cells can be enzymatically removed, and the resulting naked protoplasts can be coaxed to reconstitute walls and then to go on to develop into an entire plant. While they are in the protoplast stage, these cells may be fused with other somatic cells, and made to ingest macromolecules, including those with informational content; and they may, in short, be made to behave in many respects like the microorganisms with which so much has already been done. As the result of these unique properties, plants have recently attracted the attention of molecular geneticists and students of the control of development.

In June 1973 a symposium was held at Brookhaven National Laboratory to explore "what do we *really* know about morphogenetic processes, and what are the questions which ought to be asked concerning these processes." The organizing committee (Peter Carlson, Harold Smith, Arnold Sparrow, and Jack van't Hof) assembled an extraordinarily interesting and able group of researchers and discussants, who explored all aspects of plant development from the morphological to the genetical and biochemical. Although most of the papers deal with higher plants, there is an interesting group dealing with such fungi as *Neurospora, Schizophyllum,* and *Blastocladiella.* Occasional nonbotanical experts, such as E. B. Ford, are brought in to explore special topics such as "Supergenes: are these ecological operons?"

I went through this volume with great interest and was exposed to many