typically British thread of speculation on the unity of nature's forces which originated in the works of Isaac Newton.

The author illustrates the problems during this period in the development of a theory of affinity relating chemical and electrical force by a statement of W. R. Grove in 1874, "CHEMICAL AFFINITY . . . is that mode of force of which the human mind has hitherto formed the least definite idea." Unfortunately, this could also be the lament of the historian concerning the state of understanding of the history of chemistry during the first half of the 19th century. This book is but a modest contribution to this understanding.

DANIEL P. JONES
Department of General Science, Oregon State University, Corvallis

Salvage Archeology

Introduction to Middle Missouri Archeology. DONALD J. LEHMER. National Park Service, Washington, D.C., 1971 (available from the Superintendent of Documents, Washington). xiv, 206 pp., illus. $3.75. Anthropological Papers, 1.

To many young North American archeologists the accomplishments of the large-scale archeological salvage programs of the 1940's, '50's, and '60's have seemed questionable. Now we have a detailed summary of some of the work and its results by an archeologist intimately involved in both the field and the laboratory research. The Missouri River trough in North and South Dakota was the focus of the most extensive of these programs, and the administrative structure, the funding, and the organization of personnel and resources, together with the physical and intellectual accomplishments of this salvage effort, are the subject of Lehmer's *Introduction to Middle Missouri Archeology*. The volume should dispel some of the myths about the salvage program and make some of its inadequacies understandable.

The first part of the book deals with the history of the research and the second summarizes the results. The contents of the first section, however, avoid (and perhaps rightly) many of the emotion-laden issues raised by salvage. Lehmer notes the lack of problem orientation and the inadequacies of preexcavation survey and site evaluation but does not attempt to explain them. For example, the chapters on the origin of the program, its organizational, personnel, and funding problems (pp. 1–21, 35–38), provide a sketch of who did what and where and when, but there is little in the way of an analysis of the powerful social, political, and economic forces that relentlessly propelled the dam building program and made salvage a necessary nightmare. The book does not detail the mad scramble for money, equipment, and bureaucratic power typical of the world of salvage, a world in which the scientific merit of archeological research was measured by dam construction schedules and cubic yards of excavated dirt and debris and in which systematic research was an act of heroism in the face of overriding political necessity.

In the second, or synthetic, portion of his treatise, Lehmer uses a modified version of the Willey and Phillips phase, tradition, horizon system to "pigeonhole" (p. 25) the masses of data produced by salvage. In Lehmer's modification (i) the Willey and Phillips tradition is subdivided by introducing a new taxon, the variant, (ii) the horizon is considered an inappropriate integrative device and is discarded, and (iii) phase identifications, though deemed desirable, are restricted to the terminal end of the archeological sequence. Hence the variant is the taxon of greatest use. According to Lehmer a variant is "a unique and reasonably uniform expression of a cultural tradition which has a greater order of magnitude than a phase, and which is distinguished from other variants of the same tradition by its geographic distribution, age, and/or cultural content" (p. 32). This modification makes good taxonomic sense; it does not violate the logical structure of the Willey and Phillips formulation, and through its use Lehmer provides a lucid and useful diachronic comparison of artifact complexes, settlement patterns, and village types.

In sum, Lehmer's attempt to create taxonomic order from the extant data is the best one currently available. Nevertheless, this accomplishment must be viewed in the perspective of broader research aims and goals. The comparison of artifact inventories, settlement patterns, and village types and the construction of taxonomic orders do not in and of themselves provide testable propositions about the social phenomena with which they purport to deal. Nor do they serve to provide incentives for developing new research strategies. I do not mean to imply that rigorous artifact comparisons or well-designed taxonomic orders are not important—they most certainly are, but as one of several alternative means to the end of explicating prehistoric human behavior. Lehmer has provided a useful beginning from which we can proceed—it is to be hoped in a systematic manner.

RICHARD A. KRAUSE
Department of Anthropology, University of Missouri, Columbia

Plants in the Tropics

Introduction à la Phytogéographie des Pays Tropicaux. Les Problèmes Généraux. R. SCHNELL. 2 vols. Vol. 1, Les Flores, les Structures. xvi pp. + pp. 1–500. 180 F. Vol. 2, Les Milieux, les Groupements Végétaux. viii pp. + pp. 501–952. 165 F. Gauthier-Villars, Paris, 1971. Géobiologie, Ecologie, Aménagement.

For many years, major contributions to the understanding of West African ecology have been made by French biologists, particularly through the agency of the Institut Français d'Afrique Noire. The names of August Chevalier, Theodore Monod, André Aubréville, Paul Jaeger, and Raymond Schnell come to mind readily. *La Forêt Dense* by the last author has been particularly influential on thinking about rain forests in that area. Now Schnell, who began his studies of tropical botany 31 years ago, has taken on a larger task. In two volumes—almost a thousand pages—he reviews the phytogeography of tropical lands in general. The book was 19 years in the writing (1950–69) and is based on a course given by the author at the Sorbonne. It is no mere account of the distributions of the plants; the treatment is a synthesis of geographical material with detailed morphological, environmental, vegetational, and historical information (together with a few physiological data), so that it merits the adjective ecological.

The first volume contains two parts, devoted respectively to the historical geography of the tropics (11 chapters) and the structures and "biology" (autecology) of tropical plants (12 chapters). The second volume's first part deals with interactions between tropical plants and their environments (8 chapters) and its second is concerned with types of tropical vegetation and their dynamics (11 chapters).

The importance of this work is accentuated by our desperate need for information on which to base the com-

promise that must be made between the opposing needs of economic development and conservation in the tropics. *The Tropical Rain Forest* by Paul Richards has been the standard work of reference in tropical plant ecology, but its coverage is largely limited to the forests and it has been in print for 20 years without any revision. The time is more than ripe for a new and comprehensive treatment. Schnell succeeds to some extent in filling this need.

In this book the literature coverage is particularly strong before 1960 and is more complete for West Africa than for any other part of the tropical world. This is far from disadvantageous for students of neotropical botany, for the West African literature is much less familiar than it deserves to be. However, some of the subjects Schnell treats have advanced very rapidly while the book was in production. For example, his preference for a historical treatment of tropical floras based upon permanence of the continents in their present positions but with land bridges to connect them cannot be applauded in the face of recent work on ocean-floor spreading and plate tectonics.

Schnell is good at description; his treatments of lianes, epiphytes, parasites, xerophytes, and hydrophytes are notable, for these kinds of plants have been sadly neglected by comparison with trees in most considerations of tropical flora. He is equally good when describing various kinds of vegetation, from the aquatic to the xerophilic and from high forest to the grasslands. Always, when there is controversial matter of which he is aware, he is careful to give attention to all sides of the question. In discussing the controversial matter he presents he is less successful. By comparison with the descriptions, the discussions are often brief, weak, and conducted without the utilization of modern evolutionary and ecological approaches. Thus, the "strategy" analogy, which is helping greatly in our understanding of such evolutionary developments as those in plant reproduction (pollination and seed dispersal) is never used in this book. Indeed, adaptation by plants to the effects of the presence of animals is given relatively little weight by comparison with climatic and soil influences. Ecosystem thinking is not really involved. Where there is difficulty in visualizing the adaptive significance of a feature in terms of the physical environment, the feature is liable to be written off as a sort of hereditary burden. This is the explanation given for spines on humid forest trees, palms, and lianes. Schnell does not believe that ants are protective to plants (contra D. H. Janzen); consequently, the structures that house them are not adaptive. Neither are extra-floral nectaries.

Chapter after chapter in these two volumes is replete with information that biologists need in building working hypotheses for tropical ecology. This, rather than the discussion matter, is what makes them invaluable library reference works for those who will work in the tropics and for those who will get there vicariously because of them.

However, as reference works the volumes suffer from a terrible disadvantage in the arrangement of the bibliography. This is to be found at the end of each volume in a total of 27 topical groups that do not correspond to the chapters. The reader on encountering a reference in the text must make a guess as to which group will contain the actual citation; there is nothing in the reference to indicate its location. I was completely unable to find five of the first random sample of ten references that I sought. But, these frustrations aside, Schnell's encyclopedic work is a great pleasure to read. That one man could collect and collate so much information is very remarkable; we who will make use of it owe him a big debt.

HERBERT G. BAKER

Department of Botany,
University of California,
Berkeley

Books Received

Advances in Cancer Research. Vol. 15. George Klein, Sidney Weinhouse, and Alexander Haddow, Eds. Academic Press, New York, 1972. xiv, 360 pp., illus. $19.50.

Advances in Organometallic Chemistry. Vol. 10. F. G. A. Stone and Robert West, Eds. Academic Press, New York, 1972. x, 464 pp., illus. $24.

Alicyclic Chemistry. F. J. McQuillin. Cambridge University Press, New York, 1972. vi, 186 pp., illus. Cloth, $13.50; paper, $5.95. Cambridge Chemistry Texts.

Alone and with Others. A Grammar of Interpersonal Behavior. Murray Melbin. Harper and Row, New York, 1972. xiv, 334 pp. $12.95.

Analytical Trigonometry. Thomas J. Robinson. Harper and Row, New York, ed. 2, 1972. xvi, 288 pp., illus. $7.95.

Antarctica. Authentic Accounts of Life and Exploration in the World's Highest, Driest, Windiest, Coldest and Most Remote Continent. Charles Neider, Ed. Random House, New York, 1972. viii, 464 pp., illus. $10.

Aquatic Oligochaeta of the World. R. O. Brinkhurst and B. G. M. Jamieson with contributions by D. G. Cook, D. V. Anderson, and J. Van der Land. University of Toronto Press, Buffalo, N.Y., 1972. xii, 860 pp. + plates. $35.

L'Aquisition du Langage. Marc Richelle. Dessart, Brussels, 1971. 216 pp. Paper, 35.45 F. Manuels et Traités de Psychologie et de Sciences Humaines, Psychologie du Langage 2.

Arms and Foreign Policy in the Nuclear Age. Milton L. Rakove, Ed. Oxford University Press, New York, ed. 2, 1972. viii, 486 pp. Paper, $3.95.

Assessment of Airborne Particles. Fundamentals, Applications, and Implications to Inhalation Toxicity. A conference, Rochester, N.Y., June 1970. Thomas T. Mercer, Paul E. Morrow, and Werner Stöber, Eds. Thomas, Springfield, Ill., 1972. xx, 540 pp., illus. $32.75.

An Atlas of British Recent Foraminiferids. John W. Murray, Elsevier, New York, 1971. xii, 244 pp., illus. $22.50.

Atlas of Human Anatomy. Luis Lopez-Antunez with the collaboration of Francisco Garcia Herrera, Carlos Mendez Garcia, Felipe Vazquez Guzman, and D. Leopoldo Centeno Norma. Illustrated by Luis Amendolla Gasparo. Translated from the Spanish edition (Mexico City, 1970) by Harry Monsen. Saunders, Philadelphia, 1971. xxxii, 366 pp. $20.

Autoradiography. H. A. Fischer and G. Werner. De Gruyter, New York, 1971. x, 200 pp., illus. Working Methods in Modern Science.

L'Avenir d'une Prediction. Notes pour une Philosophie des Sciences. Gilles Lane. Presses de l'Université du Quebec, Montreal, 1971 (U.S. distributor, International Scholarly Book Services, Portland, Ore.). x, 164 pp. Paper, $1.95.

Basic Dynamics of Some Moon Effects. G. L. Luebbers. Published by the author, P.O. Box 1034, La Costa Station, Malibu, Calif., 1972. iv, 76 pp., illus. Paper, $4.

Bergson and Modern Physics. A Reinterpretation and Re-evaluation. Milič Čapek. Reidel, Dordrecht, Holland, 1972 (U.S. distributor, Humanities Press, New York). xvi, 418 pp. $23.50. Boston Studies in the Philosophy of Science, vol. 7. Synthese Library.

Beyond Freedom and Dignity. B. F. Skinner. Knopf, New York, 1971. 226 pp. $6.95.

Biochemical Actions of Hormones. Vol. 2. Gerald Litwack, Ed. Academic Press, New York, 1972. xiv, 542 pp., illus. $26.

The Biochemistry and Physiology of Tetrahymena. Donald L. Hill. Academic Press, New York, 1972. xii, 230 pp., illus. $12.95. Cell Biology: A Series of Monographs.

The Biology and Chemistry of the Umbelliferae. V. H. Heywood, Ed. Published for the Linnean Society of London by Academic Press, New York, 1971. x, 438 pp., illus. $26. Botanical Journal of the Linnean Society, vol. 64, supplement 1.

Boundaries of the Universe. John S. Glasby. Harvard University Press, Cambridge, Mass., 1971. 296 pp. + plates. $11.

Bulletins from the Ecological Research Committee. Swedish Natural Science Research Council, Stockholm, 1971. No. 11,