Plant Life in Southeast Asia

Ecological Research in Humid Tropics Vegetation (A symposium, Kuching, Sarawak, July 1963. A. J. G. H. Kostermans and F. R. Fosberg, Eds. UNESCO Science Cooperation Office for Southeast Asia, Bangkok, Thailand, 1965. 386 pp. Illus. Paper) presents an interesting, information-packed account of current ecological research and thinking relating to the vegetation of southeast Asia. The 27 contributed papers are arranged in two groups: Recent results of ecological studies of humid tropics vegetation (21 papers), and quantitative methods in the study of humid tropics vegetation (6 papers). These two headings, however, do not convey the great diversity of the contents.

The geographic range covered includes India with its humid west coast, north Thailand, the islands between the Philippines and Formosa, the Solomon Islands, and north Australia, with Indonesia and Malaysia forming the center. This region differs from the other two major humid tropics regions (Africa and America) by its wider geographic spread and lack of continental coherency. Consequently, the symposium was concerned with both continental and insular vegetation. Habitats of the latter category range from large volcanic to small coral islands. Much of the area is as yet little known botanically, although highly industrialized forms of tropical agriculture (particularly rubber) and intensive silviculture (in India) are practiced in some parts. Therefore, the papers reflect an entire cross-section of ecological research orientations, from floristic explorations with new check lists, over strict vegetation typifications, vegetation-environmental-relations studies, detailed stand statistics of important rain forests, and experimental studies in a rubber plantation. Most of the papers deal with natural or unmanaged vegetation, and emphasis is given not only to the typical lowland rain forest on latosols, but also to other important environmental segments of the humid tropics, to limestone and sandstone habitats, to swamps, and to montane and subalpine environments. With regard to the fundamental edaphic relations, it becomes clear that conventional analyses of soil nutrients give little clue to the vegetation differences of even such divergent ecosystems as heath forest on podzolized sand, mixed dipterocarp forest on fine-textured latosol, and peat swamp forest. Thus, it is concluded that nutrient cycling will be an important concern for future research. While aspects of the nutrient potential are perhaps the most important facets of ecological concern, there is a surprising absence of a consideration of water relations, in spite of observations that there are seasonal variations in rainfall in some areas, that height growth of the rain forest in Queensland is related to macropore space, and that the upper canopy of the typical dipterocarp forest shows a remarkably xerophytic appearance.

The emphasis on quantitative methods is directed primarily to sampling problems in the typical lowland rain forest. Here, the very high number of species composed of relatively few individuals presents the greatest problem in quantitative descriptive ecology. It is pointed out that the accuracy of counts of individuals is a function of the enumerations rather than of the area. However, the obtaining of any reasonable degree of statistical accuracy is currently impractical because of the labor involved. Instead, attention is drawn in methods research to investigating the accuracy of basal area sampling and plotless techniques, and meanwhile, sampling is done on the basis of arbitrary plot sizes of 0.25 to 1 acre (0.1 to 0.4 hectare; much smaller than indicated by species/area curves), and locations of plots are stratified by physiographic rather than floristic features. However, the floristic complexity of the tropical rain forest is not as universal a feature as usually believed. This is apparent from species/area curves presented (p. 236) and from the possibility of classifying the mixed dipterocarp forest of North Borneo by single dominants.

Most papers are followed by lively discussions that include basic conceptual considerations of the nature of the plant community, which some contributors believe to be a concept contrary to that of the continuum. For these interesting and thought-provoking discussions alone, the volume is worthwhile reading, even for the more locally oriented temperate-zone ecologist.

The final sections contain well-written and well-illustrated reports on the remarkable field trips into ecologically interesting terrain, including the largest mountain massif between the Himalayas and New Guinea, Mount Kinabalu (4077 meters). Some major conclusions of the symposium are summed up by the individual working groups that dealt with such subjects as secondary plant communities, quantitative methods of description, nutrients in vegetation and soil, vegetation of limestone areas, palynology, autecological research, and conservation.

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A Basis for Politics

In **Human Aims in Modern Perspective** (Antioch Press, Yellow Springs, Ohio, 1966. 133 pp. $4), D. W. Gotshalk attempts to combine the political philosophies of Plato and Karl Popper. He rejects Plato's philosopher king in favor of Popper's social engineer, pointing out, however, that a man cannot be an engineer today without some theoretical training. "Politics is engineering, social engineering. But as it is done now, it is like physical engineering done without any adequate knowledge of the principles of physics. The need is to transfer politics from its present shaky foundations to a more solid normative base" (p. 190). *Human Aims in Modern Perspective* tries to show how philosophy can do for government what physics and mathematics do for engineering.

Gotshalk reasons that a "solid normative base" for politics can be and must be based on an understanding of nature and man's place in it. Nature is both mechanical and "telic," or goal-directed. Man has telic superiority because of his ability to set his own goals and purposes, but he is relatively insignificant on the mechanical or causal level. This "paradoxical" position of man implies that his basic goals must be "to strengthen the human being's mechanical position in ways that develop or at least do not mutilate his telic nature, and to articulate his telic nature in ways that invigorate or at least do not stunt his mechanical being" (p. 30). The most comprehensive features of man's telic nature are his acquisitive and creative impulses and the fact of his "self-determinacy." Therefore, man must strive to develop a self-determinancy of a sort under which the acquisitive and creative impulses have "an equal, ample, and intercoherent fulfillment." This will be possible only in a society with institutions and government that promote the aims of man.

One difficulty with Gotshalk's argument is that his establishment of a

"solid normative base" is not very convincing. Most people would agree that the purpose of governments and social institutions ought to be the promotion of human aims and powers; but few will feel confident that this claim is justified simply by citing man's position in nature. Gotshalk defends himself against the charge that such justification commits the "naturalistic fallacy"; but it is also a fallacy to treat as obvious an inference that many people would reject. Since Gotshalk's inference is much less secure than his conclusion, the analogy between the value of physics for engineering and the value of philosophy for government is not completely convincing. On the other hand, just as discoveries by physicists can transform physical engineering, so too a political philosophy such as Marxism can change the nature of government and politics. Furthermore, in the Soviet Union a knowledge of Marxist philosophy is indispensable if one wants a career in government (or for that matter if one wants a career of any sort). We can wonder, however, whether or not such knowledge of philosophy affects in any substantial way the day-to-day process of government. The ways in which a knowledge of philosophy is, or even can be, of any real help in government, even in a Marxist government, are surely not obvious.

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Crystal Formation

D. P. Grigor'ev's **Ontogeny of Minerals** (Translated from the Russian edition, 1961, by Israel Program for Scientific Translation, Y. Brenner, Ed. Davey, New York, 1965. 256 pp. Illus. $11.50) is a book devoted to the description of general processes affecting the history of minerals from nucleation through growth to alteration and disintegration. There are 228 Russian references and 98 non-Russian references, yet the vast amount of physical and chemical data which have evolved in recent years regarding crystal synthesis are outside the scope of this book. Described are the general features by which nonobserved processes may be recognized in mineral specimens by identifying the results of the processes, such as pseudomorphs, zoned crystals, and inclusions (195 illustrations). Nucleation of crystallites occurs in space (as in magma), upon crystals of an earlier generation, upon crystals of different minerals, or upon rock fragments. Once nucleated, crystals may grow in layers, spirals, zones, or skeletons. Aggregates of the same mineral species may initially grow from randomly oriented seeds, but later growth may preferentially orient the crystals in parallels, columnar, spherulitic, or reniform aggregates. Differences in rates of growth in different directions affect the evolution of crystal forms. Deposition of new material in the re-entrant angle of twinned crystals leads to preferential growth of twinned crystals over nontwinned crystals of the same mineral species. Differences in the rates of growth of different mineral species result in the inclusion of one mineral in another, as fluorite or hematite in quartz crystals.

After crystals are formed they may be subjected to plastic deformation, twin translation, twin gliding, block formation, brittle deformation, rupture, shearing, and reorientation. Chemical changes in minerals may lead to the formation of pseudomorphs. The supply and removal of mineral substances and the volume relations during replacement and recrystallization are considered.

This book is intended as a series of lectures for advanced students who wish to familiarize themselves with the past environment to which various minerals have been subjected. It is a descriptive text, with abundant illustrations. It is not a reference book for physical or chemical data or phase relationships regarding the synthesis and growth of minerals.

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Atmospheric Optics

The first volume of *Physique de l'Atmosphère*, by Etienne Vassy, appeared in 1956. The third volume, **Phénomènes d'Absorption et de Diffusion dans l'Atmosphère** (Gauthier-Villars, Paris, 1966. 295 pp. Illus. F. 45), is now available; it appears that still more volumes are intended. The treatment is at an undergraduate level and is mostly descriptive, although some elementary derivations are included.

Multiple scattering is hardly mentioned, although results of radiative-transfer theory are occasionally quoted, as in the chapter on polarization of sky light. Most of the book is concerned with optical radiation, but there is a brief treatment of microwave and radio absorption and propagation in the troposphere and ionosphere, including scatter propagation.

For the level at which it was aimed, this is a reasonably satisfactory treatment, though old-fashioned or even out-of-date in many places. But I cannot conceive of a university on this continent teaching such a specialized course to undergraduates, and the material is far too elementary for graduate students. No references to research papers are given, and only about a dozen to monographs and review articles. There is no index.

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New Books

General

Alaska: A Challenge in Conservation. Richard A. Cooley. Univ. of Wisconsin Press, Madison, 1966. 186 pp. Illus. $5.50.

The Alien Animals: The Story of Imported Wildlife. George Laycock. Published for the American Museum of Natural History. Natural History Press, Garden City, N.Y., 1966. 240 pp. Illus. $4.95.

Archaeology: An Introduction. Clement W. Meighan. Chandler, San Francisco, 1966. 213 pp. Illus. Paper, $4.50; cloth, $7.50. Chandler Publications in Anthropology and Sociology, Leonard Broom, Ed.

Astronomischer Jahresbericht. vol. 64, *Die Literatur des Jahres 1964.* W. Lohmann, F. Henn, and U. Güntzel-Lingner. Gruyter, Berlin, 1966. 747 pp. Paper.

Astronomy and Cosmology in the Achievement of Nicolaus Copernicus. Jerome R. Ravetz. Wydawnictwo Polskiej Akademii Nauk, Warsaw, 1965. 95 pp. Illus. Paper.

Biomedical Aspects of Space Flight. James P. Henry. Holt, Rinehart and Winston, New York, 1966. 184 pp. Illus. $2.95.

The Birth of Mathematics in the Age of Plato. François Lasserre. World, Cleveland, 1966. 191 pp. Illus. Paper, $1.65.

British Bivalve Seashells. A handbook for identification. Norman Tebble. British Museum (Natural History), London, 1966. 218 pp. Illus. Paper, 14s.

Teilhard de Chardin: The Man and His Theories. Abbé Paul Grenet. Translated from the French edition (Paris, 1961) by R. A. Rudorff. Eriksson, New York, 1966. 176 pp. Illus. $5. A Profile in Science.

The Chemistry of Life. Steven Rose. Penguin Books, Baltimore, 1966. 266 pp. Illus. Paper, $1.75.

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