

institutions from the laws of motion—that all established institutions tend to continue in a straight line until acted upon by outside forces.

The second reason for believing that universities may really be in a stage of transition—that is, in the process of becoming something other than what they have been—is that there are problems now emerging with which universities as traditionally organized can no longer deal. These transcend areas which state universities are primarily intended to serve, and they exceed the resources and go beyond the educational responsibilities of private universities. These are such matters as the administration of international educational programs, the administration of a Los Alamos or an Oak Ridge, or the administration of the 34-universities consortium, to which Perkins refers, that is necessary to assume responsibility for a 200-Gev accelerator. When universities operate in such capacities, there is good reason to believe that they are acting less as universities than as an arm of the federal government. The best proof of this is that, if universities under federal leadership did not assume such responsibilities, the federal government would be compelled to organize such agencies for itself—to the great detriment of the universities. In short, there are serious questions whether universities, organized in the units we have known, will not so change that a later generation will wonder about the meaning of such phrases as “institutional integrity.” The same questions might reasonably be raised about functions as well as organization. As long as universities were primarily guided by the interests of those who wanted to be *taught* and by the self-determined interests of scholars, their activities were largely confined to the campus and were self directed. When, however, the activities of the university are guided by those whom knowledge can *serve*, their clientele is enormously broadened and their activities are differently determined.

Dean Charles S. Schlichter at the University of Wisconsin, a generation ago, used to say: “Our society is becoming one vast school.” He was a major prophet. In a society that is one vast school, it is quite likely that universities will change even more than President Perkins has anticipated.

HAROLD W. STOKES
*Center for the Advanced Study of
Educational Administration,
University of Oregon*

Biochemistry

Newer Methods of Nutritional Biochemistry, vol. 2 (Academic Press, New York, 1965. 354 pp., \$18.50), edited by Anthony A. Albanese, is the second volume in what may be a series offered by Academic Press. It is difficult to review books in which the chapters are often concerned with widely divergent topics and the authors not only write with different styles but with different objectives. I like this second volume better than the first. Volume 2 contains several really excellent chapters. The one on energy metabolism in man and animals, by Passmore and Draper, not only brings together basic physiological information in this field but presents the information in a style that makes for enjoyable reading. An excellent section by Sprince on “abnormal metabolites” of amino acid origin and one by Chiancone on enzymes of the tryptophan to nicotinic acid pathway review and interpret the literature in the fields covered and, in addition, provide valuable information on methodology. These chapters should be used as models by authors who write for this series. The section on growth and pituitary hormones appears to have been handicapped by too much material for presentation in the space available. Lack of space also seems to have been a problem in the chapter on folic acid, biotin, and pantothenic acid. However, the section on folic acid is first rate. There are good chapters on body composition and the determination of the fat soluble vitamins. Even with my own very broad definition of the field of nutritional biochemistry, I find it difficult to justify the presence in this book of a thorough review of methods for measuring the activity of anabolic steroids.

The chapter on the utilization of essential amino acids by man is primarily an evaluation of a large number of nitrogen balance studies in people fed varying sources of protein nitrogen. It strengthens my feeling that the value of nitrogen balance studies in man are often over-rated and my feeling of relief that I have not had to do such studies. A section on calcium and phosphorus metabolism is also included.

STANLEY N. GERSHOFF
*Department of Nutrition,
Harvard School of Public Health,
Boston*

Documents on Modern Physics

Hong-Yee Chiu, of the Goddard Institute for Space Studies, is the leading authority in the field that he summarizes in **Neutrino Astrophysics** (Gordon and Breach, New York, 1965. 115 pp. Paper, \$2.50; cloth, \$5). His work in the application of particle physics to astronomy has had strong implications for studies of stellar structure, nuclear reactions in stars, physics of neutron stars, and for the interpretation of the Hertzsprung-Russell diagram, so it is no surprise to find that he devotes a chapter or more to each of these subjects in the present book. There are also brief discussions of general relativity and cosmology and appendices that deal with stellar rotation and stellar temperature determinations. The author's sense of history does leave something to be desired, since he reports the discovery of Sirius B as having been made at Yerkes Observatory in 1893 (p. 16), whereas in fact Alvan Clark made this famous discovery in 1862, several decades before the construction of the great observatory at Williams Bay, and further the famous Messier Catalogue is wrongly attributed to the 17th century (p. 95). However, the theoretical content of the book predominates, and it constitutes an excellent introduction to modern topics in stellar physics, which, as such, is recommended to graduate students and senior scientists alike.

STEPHEN P. MARAN
*Space Division, Kitt Peak National
Observatory, Tucson, Arizona*

Textbook of Systematic Botany

Why is it desirable to have another book on systematic botany for Indian students? It is stated on the back of Subhash Chandra Datta's book, **A Handbook of Systematic Botany** (Asia Publishing House; Taplinger, New York, 1966. 451 pp., \$9.50), that so far the teaching of systematic botany has been a difficult task because most of the books have been written by foreign authors and do not deal with Indian plants. I hope that this statement is the publisher's idea rather than the author's opinion, for good books are already available in India; and if I were back in the Punjab teaching this subject, this is not the book that I would ask my students to buy, although I would want to have

one or two copies of it available for consultation in the library. In his 404 pages of text Datta has brought together a large amount of information from many sources, most of it accurate, but much of the book would have to be revised before I could wholeheartedly recommend it.

In the first place, it is apparent in too many places that English is not the author's native tongue. Many sentences are not idiomatic and a good many state what the author does not mean. When he states that a certain number of species are "confined" to India, he means that they grow in India, not that they are endemic there. When he says that the *Cactaceae* has fallen under the *Cactales*, he means that this is the group in which they have been placed. On page 168 he says that the fruits of a certain plant "form" a refreshing beverage. The author is not at home with the little words *a* and *the*, and he also has trouble with verbs.

The proof reading on the whole has been good, but some words have been misspelled. I noted some strange slips that are more serious. On page 119 it is stated that *Ammania baccifera*

is a roadside tree. On page 110 the name of the apricot is given as *Prunus bokhariensis* and that of the pear as *Prunus communis*. On page 115 *Barringtonia* is left in the *Myrtaceae*.

No less than 44 pages are devoted to a list of some 500 plants with their vernacular names given in 16 local languages. My experience is that such names are so often imprecise that, except in the case of well-known plants, such lists are not very valuable. A glossary giving the meanings of the highly technical vocabulary used in the book would have been much more useful to students.

Nearly 200 pages are devoted to the study of 70 families of flowering plants. A representative of each family is figured, giving cross and longitudinal sections of the flower and diagrams of salient features. This is the best part of the book. The figures are clear and very useful. It is not stated whether the diagrams are original or were borrowed from other books. The 17 photographs are very uneven in quality; some are distinctly poor.

R. R. STEWART

Department of Botany,
University of Michigan

romance of underwater archeology, but also a history of the development of underwater technical equipment and its uses. However, what is most important is the progressive improvement of underwater archeological techniques from those not far removed from looting and pot hunting to some as exacting as any used on land.

GEORGE I. QUIMBY

Burke Museum,
University of Washington, Seattle

Alaskan Indians

Just above the Arctic Circle, along tributaries of the Yukon River that drain from the Brooks Range, lies the territory of the Chandalar Kutchin. When the author of this monograph, Robert A. McKennan, visited these Athapaskan-speaking Indians of Alaska in the summer of 1933, the total society numbered less than 200 persons. Two small bands exploited the traditional mountain-and-valley domain; another small band had settled within the Yukon Flats area along the lower Chandalar River. The remaining 70 members of the tribe were in Fort Yukon or its environs. In 1933, although they were committed to the fur trade and the white man's tools and staples, the Chandalar bands still followed a nomadic life that was focused on caribou hunting.

The results of McKennan's field work, **The Chandalar Kutchin** (Arctic Institute of North America, Montreal, Canada, 1965. 156 pp., \$4), long delayed in publication, represent an approach once dominant in ethnology—anthropology as natural history—wherein a culture is seen as a congeries of traits to be severally collected, classified, and compared. As a result, this study is not designed for those anthropologists who seek insight into cultures as systems. But McKennan's carefully executed effort "to obtain as complete an account as possible of [Chandalar] aboriginal culture, as well as to note any significant changes resulting from contact with the white man" provides new and useful building blocks for Northern Amerind studies, whether directed toward historical reconstruction or toward assessing the heritage of the past in present Northern Indian life-ways.

Happily, McKennan does not deny us a delightful sketch of the non-aboriginal activities of the founder of

Underwater Archeological Techniques

Marine Archaeology: Developments During Sixty Years in the Mediterranean (Crowell, New York, 1965. 208 pp., \$9.50), edited by Joan du Plat Taylor, has evolved from the collection of studies, *Le Plongeur et l'Archéologue*, published by the Technical Committee of the Confédération Mondiale des Activités Subaquatiques (World Underwater Federation). The present work, published under the same auspices, is a fascinating and useful study of ancient ships and their routes and cargoes, maritime trade, ports, harbors, and roadsteads in the Mediterranean as well as the underwater techniques used for the recovery of the archeological data.

The content and organization of this book are excellent and a credit to the editor, Joan du Plat Taylor. A foreword by Jacques-Yves Cousteau is followed by a chapter on underwater work and archeological problems by Frédéric Dumas and one on Mediterranean trade by Fernand Benoit. Next there is a long and interesting section entitled "Some Notable Wreck Excavations" which contains accounts of the under-

water investigations and finds of eight wrecks: one at Antikythera by George Karo; another at Mahdia by Guy de Frondeville; that at Albenga by Nino Lamboglia and others; a wreck at Grand Congloué by Yves Girault; one at Titan by Philippe Tailliez; the Dramont "A" wreck by C. Santamaria and others; a wreck at Spargi by Gianni Roghi; and one at Cape Gelidonya by George F. Bass. The Cape Gelidonya wreck is dated around 1200 B.C. whereas the others range from the third into the first century B.C. The section on wrecks is followed by one on underwater surveys written by Alessandro Pederzini and others. A chapter on ports, harbors, and other submerged sites, by several authors, contains a significant section on the geology of underwater shorelines by Nicholas Flemming. The final chapter, "The future," by Joan du Plat Taylor and others, is followed by a short appendix and a usable index. The book is well illustrated with 76 text figures and 32 good halftone plates.

A reading of this work gives one not only the sense of adventure and