about the migrations of ethnic groups to America in modern times. Its subject is the physical anthropology of how, when, where, and why the New World (North, Central, and South America) was populated. It combines geography, geology, paleoanthropology, and medicine to describe how early man adapted to the various climatic and geographic conditions.

The book begins with a discussion of the effect of glaciation on man entering the New World from Asia and presents evidence for entry into Alaska for dates before and after 20,000 B.C. In this context Stewart discusses such factors as cold-screening of disease (the Eskimo, when they remain isolated, are relatively free from colds and infectious diseases) and ecological challenges to man's adaptability. By 1492, the date of the earliest European contact that really had an impact on European and American culture, man had spread over the entire Western Hemisphere. From the earliest contact there have been many theories and misconceptions about the origins of the American Indians. Stewart presents a thorough discussion of these. Anthropologists have for years estimated and guessed at the size of the Indian population at the time of contact, and many will be pleased to see Stewart's chapter on the subject, in which he includes vital information on such diverse matters as tuberculosis, syphilis, intestinal parasites, food, and blood-group patterns and discusses their possible effect on population size.

The book is historical in approach. This is best seen in the use Stewart makes of the early explorers' descriptions of their encounters with the living Indians of both the high civilizations (Inca, Maya, Aztec) and the lower cultures, from which he considers the remaining Indians in the United States and Central and South America to be descended. The following passage from the section on human sacrifice demonstrates his skill at weaving these descriptions into his story:

> As an example of the numbers of war captives sacrificed on special occasions, the dedication of a new temple at Tenochtitlan in 1487 may be cited. According to the sixteenth-century historian Diego Duran . . . , sacrifices were made simultaneously from four advancing lines of captives. From Duran's description of the lines, Cook estimates that each was about two miles long. Altogether the lines could have contained upwards of 15,000 individuals.

From a summary of some of the fossil human skeletons from the New World, Stewart also traces the development of anthropology, especially physical anthropology, in the Americas. This is a readable book, and most graduate students will find it indispensable when reviewing for their examinations.

The Pacific Islanders attempts to do the same thing for Oceania that Stewart's book does for the Americas. Because the history of man in the Pacific is in general much shorter than in the New World, Howells spends more time discussing the living populations of the Pacific. He attempts to "unravel the Pacific past" from what appears to date to be the earliest appearance of man in Australia, at about 30,000 B.C., through the settlement of Indonesia, Melanesia, Micronesia, and Polynesia, where man may have arrived as late as 1000 years ago.

Geographically, Oceania is a world of islands ranging from the continent of Australia to the tiny atolls in Micronesia. The people who inhabit this vast area vary as much in physical type and culture as the area does in geography. From a general discussion of these matters Howells proceeds to a more detailed analysis of the inhabitants from the outer differences of color, size, and shape and the inner differences of enzymes, ear wax, and erythrocytes and then to a discussion of the language differences. He uses his knowledge of multivariate analysis to obtain scientifically meaningful interpretations from the vast quantity of data printed in widely diverse publications. He devotes chapters to Australia and Tasmania, Melanesia and Indonesia, and Polynesia and Micronesia. The book offers the most extensive review of Oceania this reviewer has seen.

Both books are liberally referenced. It is unfortunate that the most recent in-depth study of early people of Hawaii, by Charles E. Snow (*Early Hawaiians: An Initial Study of Skeletal Remains from Mokopu, Oahu*, University of Kentucky Press), published posthumously this spring, appeared too late to be included in Howells's list of references. I mention it here to bring the record up to date. For anyone interested in a well-written account of the inhabitants of the New World or Oceania, I strongly recommend both of these books.

WILLIAM M. BASS
Department of Anthropology, University of Tennessee, Knoxville

Macromolecules

Biopolymers. ALAN G. WALTON and JOHN BLACKWELL. With a contribution by Stephen H. Carr. Academic Press, New York, 1973. x, 604 pp., illus. $35. Molecular Biology.

Because biopolymers, or biological macromolecules, are of interest to an increasing community this publication will be welcomed by both researchers and students. The discussions of specific techniques used in the study of biopolymers cannot, by the nature of the book, give sufficient detail to enable the reader to appreciate the techniques fully, but they do give an admirable general survey. The utilization of these tools in specific systems is well presented, although there is an unevenness in the amount of detail presented for various physical techniques.

The chapters on structural units and conformation give an excellent overview. They are, however, marred by some inaccuracies. For example, the authors write that there is no branching of chains in proteins (p. 2) and that there are no know *cis* bonds (p. 23). At times the authors present selected evidence rather than both sides of a controversy. For example, they state (citing Krimm *et al.*) that the conformation of the ionized species of poly-L-glutamic acid and poly-L-lysine is a left-handed helix, when there is equally convincing evidence, not presented, that these polymers are in the random configuration. The chapter on x-ray diffraction goes into greater depth than the accounts of other techniques. The coverage is thorough and the material well presented, but work from the Cleveland area is chosen too frequently, without historical justification, for the selection of references.

One of the best chapters is that on morphology. This subject is generally a neglected one, and here it is very well presented. Infrared, Raman, and electronic spectra are well covered and a balanced view is presented. The newly developed technique of skeletal conformation band assignment in the far infrared is omitted. The authors are not au courant on polynucleotide structure. It is stated (p. 280) that the 2-OH of the sugar ring in polynucleotides stabilizes ribo and not deoxyribo structures through hydrogen bonding. This hypothesis has been disproved by the demonstration that it is the altered puckering of the sugar moiety that is responsible for the difference in sta-

bility. The chapters on biopolymers in dilute solutions and electrical and magnetic field effects attempt to cover a profusion of techniques, at the expense of being perceptive.

The authors demonstrate their expertise in the chapters on conformation of polypeptides, fibrous proteins, and polysaccharides. These are excellent chapters updating earlier articles on the subject. The final two chapters, on nucleic acids and globular proteins, are uneven and do not match the other chapters. Their weakness is illustrated by an example given on p. 532 where a looped structure for single-stranded polyadenylic acid is discussed. This polymer has been demonstrated to be a single-stranded stacked helix. Transfer RNA is well presented. On the prediction of protein conformation the authors present a view that does not represent the lively controversy that exists in this field. Because Scheraga's early work on the prediction of conformation has been chosen as an example, a large part of the section is obsolete, this work having been superseded by more precise data—for example, it is now known that isoleucine is not a helix-former but a beta-former and that valine and threonine are not indifferent but are beta-formers. Thus the book ends on a dour note concerning predictions in this field.

GERALD D. FASMAN
Graduate Department of Biochemistry, Brandeis University, Waltham, Massachusetts

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