

papers in three broad areas. These are, (1) new approaches to description of the human physique (methods, chemical analysis, interpretations, standards); (2) factors affecting body composition (stores in the human body, sex differences, cultural environment, physical activity, "normal" adults, growth and aging); (3) applications to study of disease (nutrition, malnutrition, degenerative diseases).

This volume has many tables and graphs which those interested in growth and biology relating to the medical and paramedical sciences will find useful. As with any collaborative efforts such as this, some chapters are clearer, more concise and valuable than others. The value and clarity, however, will depend largely on what special interests and background in the subject matter the reader has. This would be an appropriate reference book for advanced biology, and professional school libraries; it's a must for research workers in the field.

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FANTASTIC VOYAGE, Isaac Asimov, 239 pp., \$3.95, Houghton Mifflin Company, Boston, 1966.

Here is a fantasy that should appeal to the biologically oriented reader of science fiction. It concerns a trip within the human circulatory system by the crew of the Proteus, a submarine reduced to the size of a bacterium. The goal is to clear a remotely placed blood clot from the brain of an eminent scientist whose survival is essential to "Our Side." This *coup d'état* must occur within one hour, before the miniaturized state wears off!

Our pressed and often quarreling crew represents a motley range of temperaments. There is the introverted neurosurgeon whose "scalpel" is a laser beam, and his loyal, efficient, but beautiful female assistant. There is the pilot-designer of the craft and a talkative M.D. who navigates using a 3-dimensional laser portrait of the circulatory tree. Last, but most prominent, is the young, resourceful security agent sent along to monitor the others. This he does expertly, concentrating with particular gusto on the surgeon's assistant.

This minuscule task force encounters trouble from the start. Shortly after being injected into the carotid artery, they make an unscheduled turn into an arterio-venous anastomosis. One crisis rapidly follows another: a detour through the venous side of the heart, and some scuba-diving encounters with antibodies and a white

blood cell, to mention a few.

The scientific detail is scanty, but much more probably would have fettered the story which is fast moving and brief. Still, it would have been intriguing if Asimov had been more explicit here and there: for example, in depicting how the Proteus entered the cochlear duct en route from the vicinity of the ear drum! The miniaturization process is panned off by Asimov with able verbal legerdemain. Here, to get on with the story, the reader must accept it or leave it. One aspect this reviewer found detracting and trite was the boy-meets-girl routine. Perhaps this is a carry-over from the movie scenario (something for everybody?) which, according to a prescript, preceded the Asimov version. As a whole, however, the story absorbs and sustains the attention. It could provide a bit of leavening among the tomes that crowd a biologist's shelf these days.

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PREHISTORIC AND PRIMITIVE MAN (Landmarks of the World's Art), Andreas Lommel, 176 pp., \$5.95, McGraw Hill Book Company, New York, 1966.

This handsome book is different from many general works on primitive art in that it includes prehistoric art as well as the art of recent "primitive" peoples, but, more significantly, attempts to relate the art of ancient peoples to that of recent peoples by postulating that the latter are the descendants of the former. This is a position easily assumed by a diffusionist, and Andreas Lommel, the Director of the Museum of Ethnology in Munich, frankly states that as his credo. He holds that variations in the world's art styles can be understood as being linked in a world wide historical scheme.

Many anthropologists subscribe to *some* diffusion of aspects of cultures, but would balk at accepting the much greater degree of diffusion propounded in this book. Lommel suggests, for instance, that rock paintings of recent Australia, and of Africa, are descended from the cave paintings of the European Paleolithic and from the rock paintings of eastern Spain. He also suggests that certain motifs, the representation of squatting figures, and of bent-kneed figures, diffused from early Eurasian sources to the Pacific, Africa, and even touched the Americas.

To most anthropologists these ideas could be entertained only as hypothetical formulations subject to critical consideration, but at best as a stepping-off point for further study. In other words, there may well be something to such a

scheme, or to parts of it, but the many gaps in the archaeological and ethnological record give one pause and prevent enthusiastic acceptance of the idea.

However there is a danger that persons interested in primitive art, but without anthropological sophistication, especially the history of anthropological theory as it bears upon diffusionism, will uncritically accept the historical scheme put forth in this book, and will regard as proven the idea that there are unbroken lines of historical relationship between paleolithic art and recent primitive art.

But, with this caution, it must be said that this is a serious attempt to deal with world primitive art, certainly more than is usually tried in many of the picture books, and a refreshingly different view of an often mistreated subject is presented.

The book is beautifully illustrated with a profusion of photographs, many in color. This volume is one of a series of ten books in the Landmarks of the World's Art, dealing with different aspects of world art history.

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THE MANY WORLDS OF MAN, Jack Conrad, 305 pp., \$6.95, Thomas Y. Crowell, Co., New York, 1964.

A simple account of elementary anthropology, both physical and cultural, as given by a professor teaching in the South. This turns out to be a significant point, as the author uses analogies and illustrations from his cultural context in Memphis, Tennessee. The book reads as a set of very excellent lectures in elementary anthropology as taught to the beginning undergraduate. This is not a derogation of the quality of content, but it does give the potential reader a flavor of the approach to the subject.

It is fully illustrated with many beautiful photographs of cultural artifacts as well as soft crayon drawings of some of the points which the author desires to make.

The author's main thesis is that there are racial differences, but that it is entirely wrong to give them qualitative grades. He is an exponent of the idea that racial differences extend in many physical ways, and he makes quite a point of this. However, he is very careful throughout to point out that no qualitative measurement can be made about these differences.

All in all, this is a fine elementary book in anthropology that would be interesting for the beginning student and for the uninitiated.

## Microbiology

PARAMEDICAL MICROBIOLOGY, Stanley Wedberg, 462 pp., \$8.50, Reinhold Publishing Company, New York, 1966.

The paramedical sciences are considered to be pharmacy, nursing, physical and occupational therapy, and medical technology. As might be expected, students in these specialty areas are duty bound to have a moderate amount of fundamental knowledge and a considerable amount of practical knowledge in many non-specialty fields. One of these fields is microbiology, which of necessity encompasses the areas of immunology and virology. Here then is the problem "How can one text be both fundamental and practical in all three areas of microbiology without becoming confusing, boring, or too verbose?" (not necessarily in that order) The answer has apparently been found by Prof. Wedberg in this text.

There are 19 chapters in this book beginning with basic considerations of the bacterial cell. The first four chapters are devoted to bacterial metabolism, cultivation and identification. Chapters 5, 6, and 7 are concerned with sterilization and the control of bacteria by chemical and physical means. The next five chapters consider various aspects of the microbiology of water, sewage, soil, air, and food followed by a chapter on chemotherapy and the transmission of disease. The final six chapters deal with pathogenic bacteria, fungi, rickettsiae, and viruses, concluding with resistance to disease. Each chapter is followed by a series of review questions. At the end of the text there is a twelve page glossary. In Chapter 5 the author states that "the principles and applications of asepsis, disinfection and sterilization have more practical bearing on nursing and medical practice than any other aspect of microbiology," to this I would like to add "and are the most difficult for the student to comprehend." It is therefore very pleasing to see that the text dwells at some length on principles and techniques of sterilization as well as the control of microorganisms by chemical and physical forces. To paramedical groups this type of basic principle is much more important than an extensive background in diagnostic bacteriology, which in any event, is best handled in the laboratory.

As regards the microbiology of food, soil, water, sewage, and atmosphere, the author is adequately thorough yet concise.

In the chapter on viruses it is somewhat surprising to find that no electron photomicrographs of animal viruses are included. Admittedly they may not aid the student in his