

lous," and so must be the ape's body; the latter was necessarily a "caricature of the human body." Fortunately, the zoological relationship between ape and man was far closer than Galen's theoretical demands seemed to allow.

In the living body, this "slime of flesh and juices," Galen wrote, "there is yet an indwelling intelligence." To the student with an "open mind" here was real "evidence of a wise Creator," and he who could advance just this step would come to "understand the excellence of the intelligence in the heavens." Here is the core of Galen's argument in *On the usefulness of the parts of the body*. It and, even more, the wonderful interweaving of anatomical fact and physiological interpretation in the treatise have long been hidden from the English reader. May's translation now transforms this situation and makes easily available one of the most interesting and influential of ancient Greek medico-philosophical texts.

WILLIAM COLEMAN

*Department of the History of Science,
Johns Hopkins University,
Baltimore, Maryland*

Blood Protein

The Haptoglobin Groups in Man. R. L. KIRK. Karger, Basel, 1968 (U.S. distributor, Phiebig, White Plains, N.Y.). vi + 77 pp., illus. \$4.80. Monographs in Human Genetics, vol. 4.

Haptoglobin is a hemoglobin-binding protein, present in the blood serum of many species, which was described unobtrusively some 30 years ago. The almost total indifference of investigators to this discovery was dramatically reversed when Smithies, in 1955, found that haptoglobin exhibited a remarkable genetic polymorphism. Since then many investigators in diverse fields have become actively engaged in carrying out studies of this interesting protein. Geneticists, biochemists, anthropologists, and physicians have all studied haptoglobin from their particular vantage points and have published their results in journals peculiar to their own fraternities. As a direct result, any but the most confirmed library hound is likely to be overcome by an attack of the snoozes if confronted with the task of assembling the scattered literature on the biology and biochemistry of the haptoglobin groups in man. All workers in the field are thus greatly indebted to R. L. Kirk, for his mono-

graph is an admirable, up-to-date account, clearly and succinctly written, of the available information on haptoglobin. It will serve as a convenient reference book, for the author has tabulated the many mutant phenotypes in the haptoglobin system and has collated the world distribution of the various inherited haptoglobin groups.

Although the haptoglobin system has intrigued many scientists, it is probably of particular interest to those concerned with understanding the ways by which proteins evolve. The effect of nonhomologous crossing over, and other chromosomal rearrangements, on the structure of a protein molecule has been elegantly elucidated by detailed structural studies on this protein. Indeed, the chemical studies of haptoglobin are probably of more enduring interest than the plethora of uninterpretable data which have accumulated on the frequency of various haptoglobin mutants throughout the world. It is hardly astonishing that the gene frequencies for haptoglobin mutants vary in different populations; the significance of the variations, however, remains utterly obscure. Those who tenaciously adhere to the orthodox view that, if a gene exists in a frequency greater than can be accounted for by conventional rates of mutation, it is probable that the gene is maintained in the population by heterozygous advantage hold to a faith that in man is rarely experimentally testable. The brilliant example of the sickle-cell polymorphism and its importance in providing protection against infection with falciparum malaria may have given unwarranted encouragement to those who still seek to discover the biological significance of human biochemical polymorphisms by relentlessly tabulating variations in gene frequencies in different populations.

The volume is readable, well produced, and invaluable as a reference source, although it is not very much more than the sum of papers previously published. Ample illustrations, often redrawn from original sources, add to the clarity of the textual material. A more extensive discussion by the author, who has himself contributed very significantly to our knowledge of haptoglobin, of the general problem of human biochemical polymorphism would have added perspective and made the volume as stimulating as it is now informative.

ALEXANDER G. BEARN

*Department of Medicine,
New York Hospital-Cornell Medical
Center, New York City*

Views on Some Fossils

Notes and Comments on Vertebrate Paleontology. ALFRED SHERWOOD ROMER. University of Chicago Press, Chicago, 1968. viii + 304 pp. Cloth, \$6.95; paper, \$3.85.

A. S. Romer's new book *Notes and Comments on Vertebrate Paleontology* is an indispensable adjunct to his eminently readable and authoritative textbook *Vertebrate Paleontology*. Readers will recall that in the latter book broad coverage of the field is achieved at the expense of digressions into controversy which might or might not be enlightening, but which would certainly interrupt the flow of the story. In consequence, *Vertebrate Paleontology* has been criticized on occasion as being too neat, with too many answers and not enough questions. *Notes and Comments* resolves this point effectively and succinctly. In it Romer provides a view of the other side of the web that is vertebrate paleontology, to demonstrate how it has been put together, showing the patches and loose ends instead of the spectacular stretches of relatively continuous fabric that are usually portrayed. As he points out in his preface, to include this material in the text would have expanded it beyond all conscience. But by dealing with "personalities and polemics" separately, and including a supplemental bibliography of 509 entries, the author has the best of two worlds, that of factual coverage and that of opinion and philosophy, without enlarging the textbook to Teutonic proportions of four or five volumes.

Organization parallels that of the textbook, each chapter consisting of commentary on the contents of a specific textbook chapter. The general approach is historical and philosophical; a brief résumé of the history of knowledge of each group down to about 1933 is given, followed by discussion of progress (if any) since that date. Nothing is omitted, but the groups emphasized are, of course, those in which the greatest progress has been made or the greatest controversy aroused in recent times.

The book does not pretend to be an unbiased appraisal of the field, but is rather a very personal expression of the opinions and point of view of A. S. Romer, nowhere more evidently than in his approach to formal taxonomy and nomenclature. His pungent remarks on these matters in the introduction and at intervals thereafter will annoy or amuse, depending upon the