Aurignacian V materials. At Badegoule, the Proto-Solutrean level underlies the Middle Solutrean, not a Lower Solutrean level, and at le Trilobite, the collection (which Smith was unable to study) comes from the only Solutrean level at the site. It would seem to me premature, in the absence of other evidence, to discount the possibility that the Proto-Solutrean may be a local or functional Lower Solutrean variant rather than a prior phylogenetic stage.

Smith indicates (p. 385) that the common tendency to view all collections from the same Solutrean stage as exactly contemporaneous negates the possibility of determining direction and rates of diffusion of artifact complexes. His own scheme of development and diffusion of Solutrean phases purports to show that the stages are, in fact, out of temporal phase from region to region. However, lacking convincing chronometric data, he bases his scheme primarily on morphological similarity between artifact complexes, and development in these complexes is compared to a standard derived from the relatively complete Solutrean sequence at Laugerie Haute. This involves the fallacious supposition that even where independent local developmental traditions exist, their evolutions must pass through the same steps, defined by the same stage-marking artifacts, that are perceivable at Laugerie Haute. A chart (p. 385) of the temporal relationship between Solutrean phases in different regions appears to show that Solutré and the Pyrenean sequence exhibit relative stagnation or retardation with respect to the Laugerie Haute sequence, but in both these cases Smith has ignored what he elsewhere recognizes as evidence that those developmental sequences involve idiosyncratic characteristics and indicator-forms that are not comparable with developments at Laugerie Haute (pp. 294, 337–38). In this case also Smith is unconvincing.

As will have been evident, Smith relies heavily on the evidence of artifacts, especially lithic artifacts, in his presentation. In justification of this approach, it must be pointed out that phase recognition in the Solutrean has always been based on the artifactual materials. In fact, even in the primary reports the paucity of published information about other evidence from Solutrean occupation levels is rather frustrating. Smith's interpretation of Solutrean habitats has been greatly hampered by this fact. Largely, I suspect, because of the spotty nature of the available information, Smith occasionally slights the evidence that does exist. His résumé (p. 64) of the Peyrony faunal list from level G at Laugerie Haute West does not include *Cervus*, and his summary of fauna from Cheynier's excavations at Badegoule (5) is far from complete, omitting, for example, *Mustela nivalis* and *Felis sylvestris* from the Proto-Solutrean and dropping chamois, wolf, fox, hare, rodents, and birds from the Solutrean II summary. These oversights are unfortunate, since they detract from the utility of the book to general students or specialists interested in the reconstruction of past local environments and in the extent of utilization of those environments by prehistoric men.

In spite of these and other faults of detail, the general quality of Smith's work is exceptionally good. It will be invaluable as a comprehensive and authoritative reference to anyone interested in Old World prehistory. One of its most important consequences will, I hope, be the development of increased interest and activity in the scientific study of prehistory.

LESLIE G. FREEMAN
Department of Anthropology,
University of Chicago,
Chicago, Illinois

References

1. C. Lévi-Strauss, *Tristes tropiques* (Plon, Paris, 1955).
2. F. Bordes, *Recherches sur les limons quaternaires du bassin de la Seine* (Masson, Paris, 1953); D. de Sonneville-Bordes and J. Perrot, *Bull. Soc. Prehist. Franç.* **51**, 327–35 (1954); **52**, 76–79 (1955); **53**, 408–12 and 547–59 (1956).
3. J. Combier, "Les fouilles de 1907 à 1925. Mise au point stratigraphique et typologique," in M. Thoral R. Riquet, J. Combier, "Solutré," *Trav. Lab. Géol. Fac. Sci. Lyon*, n.s. **2**, 93–224 (1955).
4. D. Peyrony and E. Peyrony, "Laugerie Haute, prés des Eyzies (Dordogne)," *Arch. Inst. Paléontol. Humaine Mém. 19* (1938).
5. A. Cheynier, "Badegoule. Station solutréene et protomagdalénienne," *Arch. Inst. Paléontol. Humaine Mém. 23* (1949).

Prehistory in the Americas

An Introduction to American Archaeology. Vol. 1, North and Middle America. GORDON R. WILLEY. Prentice-Hall, Englewood Cliffs, N.J., 1966. 540 pp., illus. $16.95.

This is the first volume of a projected two-volume work designed to give an integrated synthesis of New World prehistory. American archeology is a vast and complex subject with many facets, the ordering of which presents an extremely difficult task. To complicate the problem further there are many differences of opinion among experts in the interpretation of the incomplete data with which the anthropologist must work when dealing with prehistory. There are no adequate written records such as exist for so much of the Old World.

Willey's approach has been to divide the area covered into 16 major cultural traditions, dealing with the chronological, regional, and ethnographic features of each. These range from the very early, simple, and scantily documented Big Game Hunting and Old Cordilleran traditions to the highly advanced Mesoamerican tradition of the south. Each tradition is in turn divided into chronological stages which demonstrate the growth and development within it. This is not to say that it is possible to fence in each division like so many agricultural plots, but the traditions do exist and probably constitute the best framework for presenting the data. Within this theoretical frame Willey has described in satisfying detail the outstanding features of each tradition, such as its material culture and, where this may be inferred, its social and political organization.

The diversity of the American Indian is immense. It is estimated that at the time of Columbus there were more than 2000 separate languages spoken in the Americas, none of which may with certainty be related to any of the Old World. Indian cultures varied from those of the simplest hunting and gathering groups to highly urbanized, civilized peoples, with vast differences in social and political organization and technological skills. Some groups adjusted to life in the frozen Arctic, others to hot arid deserts or tropical jungles. From the Arctic Eskimo to the inhabitants of Tierra del Fuego can be found in varying degrees almost the complete scale of human adaptations.

It is generally agreed that the American aborigines derived from Asia. All have dark hair and brown eyes. Otherwise there is a wide range in physical types, including variations in blood type, stature, features, and skin color. Is this the result of immigration by peoples of different origins over a long period of time, or of variations that took place after arrival in America? Even more difficult is the problem of the origin of the culture traits that were

found among the Indians at the time of first recorded contact with Europeans, or that various groups had possessed in the past and that were modified or lost at various times and places over the centuries. Were such developed traits as pottery making, agriculture, metallurgy, irrigation, and sculptural art produced indigenously from a simple Stone Age base, such as was presumably possessed by the various Bering Strait immigrants, or were they the result of direct contacts with more civilized peoples of Asia or other parts of the Old World? How long has man been in the New World? It is now firmly established that human history in America goes back some 12,000 years, but the evidence beyond that is still inconclusive. Many archeologists are willing to admit a probability that human prehistory in America will eventually be extended backward to 40,000 years or more, but convincing evidence is still lacking.

These are problems which have long furnished fuel for controversy and none of which are simple of solution. Although progress is being made, largely by the archeologist enlisting the services of such disciplines as geology, physics, botany, chemistry, and biology, much remains to be done.

The writer of an overall history must consider all these problems, and Willey has done so most ably and carefully. In addition to presenting the firmly established data he has not avoided the debatable subjects, but has presented the evidence on both sides, always being careful to distinguish between proven facts and matters that are still speculative. The book is copiously illustrated with 250 photographs, more than 140 drawings, and 45 specially prepared maps and charts to guide the reader through the maze of cultural and geographic areas and time periods. It is by far the best work that has appeared on the broad subject of American prehistory, and one can assume that volume 2, which will deal with South America, will be of the same quality. This is the first time that a satisfactory approach has been designed for this complex subject. The book will for a long time be an indispensable text for the student and the interested lay reader, as well as a guide for the professional.

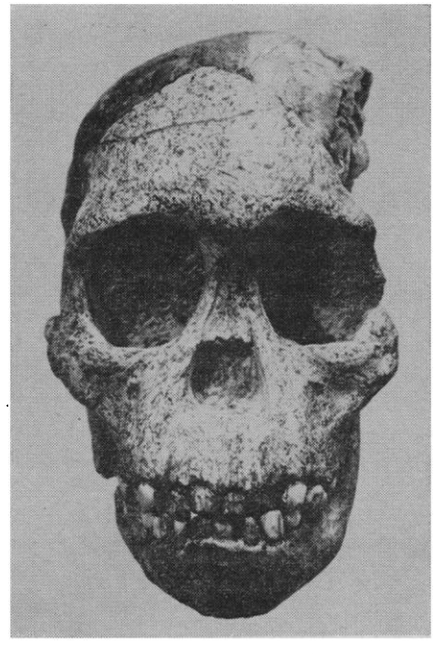
M. W. STIRLING
3311 Rowland Place, NW, Washington, D.C.

Hominid Evolution

Man-Apes or Ape-Men? The Story of Discoveries in Africa. WILFRID E. LE GROS CLARK. Holt, Rinehart and Winston, New York, 1967. 160 pp., illus. $3.95.

This little book is a welcome addition to the voluminous literature already published about the australopithecines, those important and controversial fossil relatives of man found at a number of localities in Africa from 1924 onward. The author is not only a distinguished anatomist and physical anthropologist but also one of the relatively few qualified individuals who have been able to study, at first hand, many of the relevant specimens. His views therefore merit close consideration.

After a brief opening chapter that deals largely with man's relationship to the anthropoid apes, Sir Wilfrid presents an interesting historical account of the discoveries of australopithecines, including therein some details of his first visit to South Africa, in 1947. The remainder of the book is devoted chiefly to his interpretations of the teeth, skull, pelvis, and limb bones of the australopithecines. In the two final chapters, the author attempts to reconstruct some aspects of australopithecine ecology and evolutionary origins.



Immature skull of *Australopithecus africanus* found at Taung, South Africa, in 1924. This was the first skull of this fossil relative of man to be discovered. [Courtesy of Raymond A. Dart, from *Man-Apes or Ape-Men?*]

Sir Wilfrid is thoroughly convinced that the australopithecines were directly ancestral to the genus *Homo*, rather than a sideline of hominid evolution which paralleled that of, but did not develop into, actual man. In this he is in agreement with current orthodox belief; although, it should be emphasized, there are some notable heretics. He does not, however, include the australopithecines in the genus *Homo*, as has been done by a few writers. Rather, he places them in the genus *Australopithecus*, recognizing two species, *A. africanus* and *A. robustus*. He thinks it probable that the former, more gracile type was ancestral to *Homo*, and that the latter, more robust type was "an aberrant sideline of evolution that became extinct." Indeed, the author regards the australopithecines as representing the first stage of hominid evolution after the family Hominidae diverged from an ancestral stock common to it and the anthropoid apes. Hence he seems to have no doubts that they were the "immediate precursors" of *Homo erectus*.

Consequently, Sir Wilfrid devotes considerable space to an attempt to demolish the claims of "Telanthropus" (assigned by John Robinson to *Homo erectus* in 1961) and, especially, "Homo habilis" to membership in the genus *Homo*. These highly controversial fossils were found associated with undoubted australopithecine remains at Swartkrans, South Africa ("Telanthropus"), and, recently, at Olduvai Gorge, Tanzania ("Homo habilis"). "Telanthropus" consists only of some fragmentary jaws, and consequently can more readily be dismissed. "Homo habilis," however, comprises not only jaws but also much of a braincase, as well as various limb bones, including the better part of a foot. If these specimens belong to an actual member of the genus *Homo*, it is more than difficult, as Tobias [*Science* **149**, 22 (1965)] has noted, to make the australopithecines the direct ancestors of man. It is true that Sir Wilfrid is by no means alone in regarding both "Telanthropus" and "Homo habilis" as varieties of australopithecines (more specifically, of *Australopithecus africanus*, he believes), rather than as hominines. In this respect, however, he is no more persuasive than those who regard these two fossils as actual men. He finds it "difficult to suppose that australopithecines and more advanced hominids (pre-