explain why the continuing cogent objections to evolutionary interpretations of the archeological record as it was known in the late 19th century by conservative scholars, such as the eminent geologist John William Dawson, were thereafter politely ignored by contemporary scientists. Cultural evolutionary thought had been nurtured by the Enlightenment philosophy of the 18th century, and, despite efforts by people such as Richard Whately to champion the concept of degeneration, it had grown increasingly popular among the middle classes, especially in Britain. These classes were pleased to identify their own growing economic and political power, and the accelerating technological progress on which it was based, with an irreversible historical process. This surely played no small part in making evolutionary views of all kinds more respectable during the 1850's, as is evident in the writings of the naturalistic philosopher Herbert Spencer. It also made it possible for the first time for reputable paleontologists to abandon the theological underpinnings of both biblical chronology and creationism without incurring general public disapproval. With someone like Charles Lyell, who believed it to be a serious tactical error to assault too publicly "the popular prejudices of the day," this change in public attitude must have weighed especially heavily.

Although he has chosen to analyze the recognition of human ancientness, not its effects, Grayson agrees with Glyn Daniel that the discipline of prehistoric archeology developed largely out of the study of the antiquity of humanity. This is true of Paleolithic archeology and perhaps also of prehistoric archeology as a whole in England and France. Yet, early in the 19th century, Scandinavian archeologists, most notably C. J. Thomsen, J. J. A. Worsaae, and Sven Nilsson, had been inspired by theories of cultural evolution to create a discipline that used seriation and stratigraphy to construct prehistoric chronologies and further sought to learn about how human beings had lived in prehistoric times. Their data, which were post-glacial, did not raise the question of the antiquity of humanity. Nevertheless, they cooperated closely with geologists, zoologists, and ethnologists to interpret their data behaviorally. This archeology spread to Scotland and Switzerland, and its impressive achievements were chronicled for American readers by von Morlot in 1861. Nilsson's studies of stone tools set new standards that must have influenced the descriptions and interpretation of Paleolithic finds in the 1840's and 1850's. Grayson notes a casual attitude toward artifacts as a weakness of much of the work done by earlier geologists and paleontologists. Discerning the antiquity of humanity and tracing the evolution of stone tools from ever simpler beginnings added an important new dimension to prehistoric archeology after 1860. Yet, when early Paleolithic archeology was closely linked to paleontology and geology, certain mechanistic modes of analysis, such as a preoccupation with index fossils, entered prehistoric archeology from the natural sciences. These were far less appropriate for the study of prehistoric human behavior than the Scandinavian approach had been. Archeology has had to struggle hard in the 20th century to overcome the negative effects of these borrowings and to become once again a study of how human beings lived in the past.

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Stone Age Life in Africa

The Middle Stone Age at Klasies River Mouth in South Africa. RONALD SINGER and JOHN WYMER. With contributions by K. W. Butzer, N. J. Shackleton, and E. Voigt. University of Chicago Press, Chicago, 1982. vi, 234 pp., illus., + plates. $30.

Toward the close of the Middle Pleistocene, more than 130,000 years ago, human populations across Africa were turning to new ways of making tools and extracting a living from the landscape. Acheulean assemblages, which had dominated the archeological record for much of the Pleistocene, were giving way to industries of the Middle Stone Age. This shift can be documented by the disappearance of bifacial handaxes and cleavers, coupled with the use of a wider range of stone implements based on prepared cores and flakes. Although technological advances made in the earliest Middle Stone Age appear to be modest, there are signs of increasing sophistication as the new industries were refined and spread. Middle Stone Age populations were now able to occupy sites along the African coastline and to live in a variety of inland settings. It is clear that these people were better equipped to colonize the more humid, wooded regions of Africa as well as the open grasslands. Fire was used regularly, and there is evidence for the systematic exploitation of marine food resources. Middle Stone Age hunters also took many sorts of terrestrial game by different methods, even if they were not so skilled in this respect as the Late Stone Age people who succeeded them.

Compiling such details of Stone Age life is possible in no small measure because of the efforts of archeologists working in southern Africa. One of the most important sites is Klasies River Mouth, located on the coast of the eastern Cape Province of South Africa. Really a complex of several caves and shelters, Klasies was excavated between 1966 and 1968. Publication of results has been delayed for rather a long time, but this attractive monograph contains much useful information. Studies of the sedimentary sequence by K. W. Butzer, together with N. J. Shackleton's oxygen isotope analysis of shells collected from the deposits, place the earliest occupation at the beginning of the Last Interglacial, 120,000 to 130,000 years ago. The caves were then inhabited intermittently for a long period, and Butzer's work suggests that the youngest Middle Stone Age levels date to about 60,000 years ago. Klasies was then abandoned and not reoccupied until late in the Holocene.

The bulk of the monograph is devoted to descriptions of the excavations, archeological stratigraphy of the main caves, and the stone artifacts recovered. The earliest industries are classified as MSA I and MSA II, followed by the Howieson's Poort. Howieson's Poort is characterized by the addition of some new artifact classes and by the loss of others. Since that occupation is followed by other MSA layers, the authors note that there may have been an intrusion of people from some other region. However, Howieson's Poort material has now been identified in comparable stratigraphic settings at other South African localities, and probably this industry should be viewed as an integral part of the Middle Stone Age.

Other sections deal with faunal remains. Mollusk shells, present throughout the sequence and described by E. A. Voigt, show that people were collecting marine foods on a selective basis. The bones of seals and seabirds are also plentiful, but R. G. Klein's work (summarized only briefly here) suggests that the Klasies people were not as adept at fishing or catching flying birds as were the Late Stone Age inhabitants of the same coastline. Among mammal remains, species such as eland are represented by adults as well as juveniles, and whole groups of these larger, more docile animals may have been killed by driving. Dangerous animals like buffalo

occur more frequently as very young individuals, and it is likely that the Middle Stone Age hunters took mainly the more vulnerable members of the herds.

Klasies is especially important because it is one of a very few sites to have yielded human skeletal remains in firm association with Middle Stone Age tools. Human bones from the MSA I and II levels are mostly rather fragmentary, but several mandibles are reasonably well preserved. One from MSA I deposits is quite complete, with a heavily built corpus and a projecting bony chin. There is no development of an internal shelf or transverse buttress behind the symphysis, and this jaw probably represents modern *Homo sapiens*. Other specimens from MSA II levels tend to support this conclusion. A piece of frontal bone is much less robust than the corresponding brow parts of the famous Florisbad cranium from the Free State. Several jaws are also rather different from archaic African fossils and from Neanderthal mandibles from Europe. This evidence from Klasies, perhaps along with material from Border cave in the Natal Province, suggests that at least some Middle Stone Age populations of southern Africa were modern anatomically. While there are still questions concerning both the provenience and the anatomical significance of some of the remains, it now looks as though modern *Homo sapiens* was present in southern Africa at a surprisingly early date. This of course raises questions about the origin and dispersal of recent humans across the Old World. Such questions may be answered as more sites are examined in as much detail as Klasies River Mouth.

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"Tikopia ornaments and bodily adornment. The standing figure wears a pearl-shell breastplate and carries in his right hand a sheaf of aromatic leaves. Similar leaves are also inserted in the *maro* of the seated figure at right. Note also the tattooing of forehead and breast." [Reproduced in *Tikopia* from J. S. C. Dumont d'Urville, *Voyage de la corvette* l'Astrolabe, *Atlas* (Paris, 1833); artist, M. de Sainson]

A Pacific Island

Tikopia. The Prehistory and Ecology of a Polynesian Outlier. PATRICK VINTON KIRCH and D. E. YEN. Bishop Museum Press, Honolulu, 1982. xviii, 398 pp., illus. Paper, $28. Bernice P. Bishop Museum Bulletin 238.

Within the last two or three years some high-flyer archeologists have urged the discipline to "get back to the basics." *Tikopia* is by two scientists who have never left them and who, between them, show how interesting and useful the results can be.

Tikopia's 4.5 square kilometers lie in the western Pacific, about halfway between the Solomon Islands and Fiji. Several islands are within two days' sail, and many have influenced its history, but it is quite isolated even today.

In 1929 its 1300 people hosted ethnographer Raymond Firth, who described their life, especially its social and religious aspects, in a series of classic analyses. The present book, the result of research by archeologist Kirch and ethnobotanist Yen in 1977 and 1978, gives a historical dimension to Firth's analyses. Kirch and Yen's research was concerned with elucidating Polynesian cultural adaptation to a small, high island and the role of microenvironmental adaptations in this; the dates and origins of contributions from elsewhere (if such there were) to the island's history; the persistence and direction of trade and exchange and its effects on the island's history; and the history of subsistence strategies. The successful pursuit of these goals required a single underlying approach, namely to find evidence of the interaction between humans and their environment.

Yen's opening chapters show clearly that the surface of the volcanic island is now almost totally a managed environment. Some indigenous flora are cultivated for their use and beauty, like the *Calophyllum* trees that stabilize sand dunes; the crater lake, Te Roko, separated from the sea by a tombolo of sand, is annually and manually joined to it for fish restocking; the steep slopes of Faea are covered with multilayered orchards of harvestable plants that maintain soil enrichment and limit erosion; along the flatlands, accreting dunes are barricaded with coral blocks. Yen's description of the Tikopian risk-minimizing system of Oceanic agriculture elegantly complements his earlier one of nearby Anuta.

But how did this environment come into being? Tikopia's own historians do not account for it: to them, the island has always been similar. Answering this question is Kirch's contribution.

Kirch starts with straightforward archeology. The smallness of the island, much of it steeply sloping and therefore not a depositional environment, allowed for an intensive surface survey. This produced two areas of potsherds, not made in historic Tikopia. Between them, these sites of Sinapupu and Kiki revealed a cultural sequence of some 3000 years' duration, starting with settlers drawn from the same pool that supplied many other Pacific islands, namely people making Lapita pottery. Kirch's sampling and excavation techniques, as well as his analysis of artifacts and discussion of their demonstration of changing relationships with the outside world, are elegant and well presented. Occasionally he falters, as when, having provided the best analysis of shell adzes to date and shown that those aspects (such as bevel shape) that are clearly related to use continue unchanged throughout the se-