

Chapman discusses the size of seed banks. This should be a crucial paper but few people will be convinced that the problem can be resolved on the basis that the variability in which plant breeders are interested is distributed at random; indeed several of the other contributions indicate that it is not, particularly because of the local origin of variation and the impact of local selection. The assessment by Singh and Williams is much more pragmatic.

Progress in *in vitro* preservation is covered by Withers; the problems of preservation of wild species *in situ* by various forms of nature reserves are assessed judiciously by Ingram and Williams; and there is a series of excellent papers on the evaluation of what has been collected. Apart from Harlan's review, we are left with the overwhelming picture that we can

conserve anything if we have the money, but that we are drowning in the twin problems of what to conserve and, once we have conserved it, how to use it. Papers on the fashionable new technique of some clonal variation and recombinant DNA suggest that this is where the future lies. I doubt it.

In his final paper, Holden argues that orthodoxy allied to critical commonsense is the real way forward. We shall need further collections, but now they must be only of threatened material and to cover particular deficiencies, and must be on an international basis: a very sensible end to a valuable and provocative book. □

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Mixed selection

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Hominid Evolution and Community Ecology: Prehistoric Human Adaptation in Biological Perspective.

Edited by Robert Foley.

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WHILE the layman may be fascinated simply by the great age of ancient bones and artefacts, palaeoanthropologists value them mainly as data by which to follow the course of human biological and cultural evolution. Such objects are often ambiguous in their implications, and using them to construct a truly compelling and comprehensive story remains a difficult task. In large part, the problem is the actual quantity and quality of bones, artefacts and other real data, which are often distressingly sparse. In part, it is also a matter of the need for more powerful analytical frameworks, based largely on present processes that must also have operated in the past.

One framework that nearly all palaeoanthropologists use, at least implicitly, centres on the concept of natural selection and its ramifications, that is evolutionary theory. Robert Foley, the editor of this book, believes that palaeoanthropologists should apply evolutionary theory more explicitly, especially the idea of coevolution, according to which members of an ecological community evolve at least partly in response to evolutionary changes in other members. Thus, for example, as predators become fleetier of foot, natural selection will tend to favour fleetier prey, and fleetier prey will in turn lead to selection for fleetier predators.

To explore the implications of ecological thinking for palaeoanthropology, in 1981 Foley organized a symposium from which the present book grew. Six of the contributors attended the symposium and four did not, but each was asked to write a

chapter illustrating the role of ecological concepts in understanding human evolution. Perhaps not surprisingly, Foley's own contributions come closest to the mark. In the first of his two chapters, he succinctly outlines those aspects of evolutionary theory he thinks palaeoanthropologists will find most pertinent. In the second he discusses the variables — mode of locomotion, body size, population density, home range size, group size, diet, social organization, environment and so forth — that are clearly crucial for reconstructing the ecology of very early people. Unfortunately, most of the variables are very poorly controlled with real data, and Foley's ecological reconstruction is necessarily vague and inconclusive.

Among the other authors, perhaps the one who took Foley's brief most seriously was Garrard, who suggests that the extinction of some Pleistocene mammals in south-west Asia may have been caused by "human interspecific competition", by which he means competition between people and animals for the same resources. This is an interesting possibility, but Garrard presents no real supporting evidence, and his treatment of the broader issue of extinctions is very weak, despite its obvious relevance to the book's main purpose.

Two other contributors who deal reasonably closely with Foley's stated theme are Turner and Gamble. In an essay that is stimulating and thoughtful, but ultimately unconvincing, Turner argues that the Middle and Upper Pleistocene dispersal of human beings across Eurasia and into the Americas can be illuminated by an analysis of the dispersal of other large mammals, especially predators. In a stylistically similar essay dominated by highly readable argumentation rather than empirical demonstration, Gamble suggests that differences in available energy can be used to explain regional variation in the Palaeolithic archaeological record of Europe.

Some of the remaining chapters are closer to the book's theme than others, but

none deal with it directly. Potts concludes that early people probably accumulated most of the bones at some sites in Olduvai Bed I, though the sites need not have been "home bases" in the sense of modern hunter-gatherer camp sites. To support his conclusion, Potts cites the presence of numerous stone artefacts, as well as features of the bone assemblages that are probably due to people rather than to carnivores or other "natural" agencies.

Scott deals clearly and succinctly with the evidence for human occupation of Britain in the second half of the Last Glacial period. Conditions were obviously extremely harsh and, compared to the situation in many parts of western Europe, people appear to have been rare. Hill touches on the question of how we might distinguish bone accumulations created by hyenas from those created by people, but he focuses mainly on the scientific-philosophical nature of explanation or interpretation in palaeoanthropology. Although it might not have been Hill's intention, it could be concluded that he believes the interpretation of Plio-Pleistocene bone assemblages is something we can write about but not actually do.

Gowlett sees stone artefacts, humanly butchered animal bones and other archaeological traces as reflections of the existence of human mental abilities from at least two million years ago. He may also believe that natural selection sponsored progressive change through time in these abilities, but from his presentation one cannot be sure.

Finally, Roberts provides a clear, up-to-date and comprehensive overview of Pleistocene climatic change, particularly as it is known from deep-sea cores, and Stringer surveys the human fossil record, stressing broad issues such as the mode of human evolution (whether gradual or punctuated) and the possible importance of climate as a selective factor on body form in fossil people. As independent contributions in their respective fields, Roberts's and Stringer's chapters are among the best in the book, but they are also among the furthest from the central theme.

Sadly the book does not demonstrate the value of specific ecological concepts for understanding human evolution, if only because most of the authors fail to address the issue directly. Beyond lacking a common focus, the chapters also vary considerably in quality, and I think it can reasonably be asked whether they should have been published together. There is a great deal in the book to interest any palaeoanthropologist, but there is also much that would have been winnowed out or improved if the papers had been subjected to the refereeing process used by most specialist journals. □

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