

The book is a contribution to the literature of the "Cambridge school of palaeoecology" founded by Eric Higgs, and in their paper Bailey *et al.* suggest that this school is characterized by three distinctive concepts: site catchment analysis, close man-animal relationships and optimum resource exploitation systems. These are important components of many of the analyses here. What perhaps adds further interest is the attempt to integrate palaeoecology with the other developments in hunter-gatherer studies. Thus absent but looming large is the figure of Lewis Binford, and his model of hunter-gatherer variability. Binford contrasted, on the one hand, logistically organized hunter-gatherers (whose subsistence depends on planned and highly structured foraging trips), and on the other, collectors (who subsist more opportunistically in a less-differentiated environment). He was able to show that variability in adaptive strategy had important behavioural and archaeological correlates. The juxtaposition in these papers, especially those of Torrence and of Davidson, of discussion of this model and of the principles of palaeoecology highlights many of the difficulties in palaeolithic studies and the extent to which palaeoecology has become divorced from other developments in the discipline. For example, although the concept of optimality is employed by several authors little attempt is made either to relate it to its evolutionary basis or to use the techniques of optimal foraging theory. Another example would be the general disregard for the character of archaeological formation processes and the growing field of taphonomy and middle-range theory, such that Bahn (p. 169) can still say that he is "clinging to the hope that faunal remains . . . are representative of the prehistoric economic strategies despite differential preservation and sampling".

These apparent shortcomings are, though, the product of two very positive elements that lie at the heart of this stimulating book. First, it attempts to integrate two traditions in palaeolithic archaeology — the small scale, ethnographically-inspired and behaviourally-based American approach, and the long-term, ecologically orientated British school. And secondly, by presenting a view of the European palaeolithic in which low density populations employ a series of adaptive techniques (ranging from information exchange and alliances to mobility and highly organized hunting strategies) to solve the problems of survival faced by hunter-gatherers in the European glacial environment, these authors have continued the transformation of our perception of palaeolithic peoples from tool-making automatons to real social and biological organisms.

Robert Foley is a Lecturer in the Department of Anthropology at the University of Durham.

## Talking science

Eugene Garfield

**The Foreign Language Barrier: Problems in Scientific Communication.**

By J. A. Large.

André Deutsch: 1983. Pp. 196. £9.95.

Few would argue with the claim that English is the lingua franca of international science. Therefore, if your native language is not English you face a problem. Unless you can read English you won't know most of what is reported in the literature; and unless you can write and publish in English, your own research may be overlooked by the world scientific community.

J. A. Large, however, examines the language problem from the perspective of scientists whose native language is English. He suggests that researchers in Britain and the United States have been under no pressure to acquire and maintain proficiency in a foreign language, presumably because English has been the dominant language of science for decades. As a result, those speaking and reading only English are ignorant of significant results reported in foreign-language publications.

While the percentage of the world's scientific publications that are published in non-English languages is relatively small, the absolute number is growing. In particular, Japanese and Russian language materials have increased significantly. But it is not clear how much is not covered by the leading abstracting services, which claim to be comprehensive. In any case, the assumption here is that Western scientists are becoming less aware of important research buried in the growing mass of non-English language publications.

Large supports his claims with an array of surveys and studies on library usage of foreign-language materials, world output of publications in various languages and citations to foreign-language publications in journals. His presentation would, however, have been improved if more data had been provided. Each study should be described in terms of the size of the sample and the years to which the data apply. A few additional lines in the text and tables would have allowed the reader to judge how representative and relevant the data are with a minimum of effort.

Although Large's studies and surveys examine in detail the languages of published articles, they do not consider the nationalities of the authors. For example, we are told that English-language articles cite other English-language publications almost exclusively, and only a small proportion of the references cite foreign-language material. But what percentage of the cited English-language items were written by French, German, Russian, Japanese or Chinese authors? Conversely, a significant proportion of references in non-English language articles are to

English-language publications — but how many of these English-language articles were written by scientists from the citing author's country? If scientists in country A cite research conducted in many different nations and reported in English, while scientists in country B only cite papers by their own nation's authors reported in several languages, who is less aware of the international literature? Until we analyse the nationality of the citing and cited authors, in addition to the language of the citing and cited articles, it is premature to characterize the language problem in world scientific communication as a "barrier". We need a comparative bibliometric method that takes into account both interlingual and international links in the literature before we can conclude that there is a language-based crisis in science.

I cannot agree with Large that the language problem currently poses the biggest obstacle to scientific communication. In my opinion, the main problem today is information overload. The volume of scientific publication is still increasing, exponentially in some fields. It is more difficult for scientists everywhere to digest everything that is significant in English, much less the foreign-science press. Can we really expect them all to learn Russian, Japanese, Chinese as well as French and German?

Large concludes that computer-based translations will help to solve the language problem. However, indiscriminate translations will only increase the problem of information overload. Information services and review journals have made solid advances in identifying the more significant, high-impact research within the mass of scientific literature. More could be done to identify core material in foreign journals, but only the best should be added to the already overloaded communication channels. The best guarantee that this will occur is through personal contacts between scientists. A comprehensive translation programme would only increase the isolation of scientists by discouraging them from acquiring even a minimal proficiency in a foreign language. If there had not been a cover-to-cover translation programme maybe even more Russian scientists would be publishing in English today. Translation programmes might also decrease attendance at international conferences, where much current scientific information is exchanged.

The cultural and political value of linguistic training is indeed vital to good science. It needs to be promoted not because it will help us deal with the literature better, but rather because it will increase the kind of personal contacts that lead to better identification of important information.

Eugene Garfield is President of the Institute for Scientific Information, Philadelphia, the publisher of Current Contents and the Science Citation Index.