

EARLY HUMAN MIGRATIONS: USING ALL THE EVIDENCE

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Introduction

This paper was the final one given at the conference, in a session at Tbilisi mainly devoted to more general topics. Many speakers during the conference, if not discussing aspects of the Dmanisi site itself, had very helpfully chosen to review the earliest Palaeolithic sites of their own home regions. It seemed to me, however, that I had done this recently for Britain (1996) and my country's geographical location in any case made its earliest Palaeolithic occupation only marginally relevant to a conference considering Early Humans at the Gates of Europe: some might feel that Britain only became a gate of Europe with the opening of London's Heathrow airport, well into the Holocene. At the time for choosing topics, my understanding was that Spain would be well represented at the conference; otherwise, I might have spoken about the 1995 International Congress held at Orce in Andalucia, and discussed the significance of the Orce Basin sites in relation to Dmanisi. As it was, I chose a general theme which seemed to me worth stating clearly to a combined audience of archaeologists and physical anthropologists - though, in the event, fewer of the latter were able to attend than had been expected. Perhaps some of those who were unable to come will read my comments here.

The text that forms section 2 is the long abstract of my communication, pre-circulated with the conference papers, and is unaltered here except for the correction of two typing errors and the insertion of a small number of references. At the conference session itself, I used my twenty minute slot to illustrate with slides some of the points made in the precirculated abstract, offering a few specific examples, and in Section 3 below I will briefly summarise that presentation. Section 4 is a short retrospect at the end of the conference, the paper itself naturally having been prepared in advance. This whole published version accordingly presents the actual communication I gave, rather than being a subsequent re-write with hindsight.

The precirculated text (early human migrations: using all the evidence)

It is always extremely important when hominid fossil remains are discovered, especially if they are in datable deposits: they offer the best possible proof of human presence in a particular area at a particular time, for example when we are trying to trace when and how early humans moved out of Africa and colonised other parts of the Old World, whether it be Georgia, Britain and other parts of Europe, or China and Southeast Asia. At their best, the human fossils can be identified to species level, and help us to understand which human species were capable of long-distance migrations, and also how new species emerged as humans adapted to the very different living conditions of higher latitudes and other climatic or temperature zones. A positive example of this is the development of the classic Neanderthal form in Europe, while a negative one is the apparent absence of any occurrence of an Australopithecine outside Sub-Saharan Africa.

But hominid fossils are not always found well-preserved, in an ideal diagnostic state. Sometimes, it may not even be possible to be sure of their genus, let alone species, and the literature has various examples of supposedly human bones or teeth which eventually turned out to belong instead to animals. Much as we might like to have the story of the first human migrations fully documented by abundant hominid fossil evidence in all areas and at all the important archaeological sites, it simply is not so and never will be. Britain and India are two examples of areas where hominid fossils are sadly scarce. We must therefore be prepared to make full use of all the other evidence that is available, and the largest single category is early Palaeolithic artefacts, especially those made of stone, which have a superb capacity for survival and a high level of identifiability.

Any individual early hominid had only a single

skeleton to leave behind, and could leave it (by dying) only on one occasion - unless he or she might previously have lost the occasional tooth. By contrast, each individual hominid may have been responsible for the creation of many hundred artefacts in his or her lifetime - many thousands, if knapping debris is counted - and could leave them behind in many different places, as a genuine trail of evidence. Whether we like it or not, there will always be many more artefacts than hominid fossils in the Early Palaeolithic archaeological record. Dmanisi is one of those precious sites that has both these kinds of evidence, and more, in association; but even here, the point could be made that artefacts greatly outnumber human fossils. It is true that, if there were no stone artefacts at Dmanisi, we should still regard it as a vitally important site for tracing early human migration in the direction of Europe, because of the *Homo erectus* mandible. But the converse is also true: take away the mandible, and we still know that early humans were here, and there is still much to be learned at Dmanisi from the presence of undeniable artefacts and the associated faunal, environmental and dating evidence. Similarly, at Orce, in southern Spain, at the other Gate of Europe, the claimed hominid fossil evidence has created a certain degree of controversy (cf. Gibert *et al.*, 1998a, with further references), and even on the most optimistic view it remains rather unsatisfactory; but the presence of definite stone artefacts in the same levels, or in levels of the same age nearby, still places Orce beyond doubt as a site where early humans were present. One might think too of the excitement justifiably caused by the find of early stone artefacts on the island of Flores, Indonesia, although no hominid fossil was recovered with them (Morwood *et al.*, 1998).

If early hominid fossils are sometimes hard to assign with confidence to a particular human species, artefacts can of course *never* be so assigned, and that is their great drawback in the present context. For example, we still do not really know which human type was the first to make handaxes, although the handaxe is a tool-type of considerable significance in our attempts to trace early human movements. Why there are so few true handaxes and cleavers east of the Indian sub-continent is a question with many possible answers.

On the other hand, artefacts, as they are commonly studied today, still have some interesting information about humans to convey. At undisturbed Palaeolithic sites, studies of the *chaînes opératoires* that created the artefacts can enable us to confront directly early human thought

processes and decision-making at various levels, and to observe how these change as time passes. This kind of information is certainly well worth considering against the background of human evolution - such aspects as brain development and manual dexterity - as revealed by the whole mass of surviving fossil evidence. Again, perfectly preserved stone artefacts may sometimes yield to microwear analysis definite information concerning how they were used, and on what materials - wood, meat, hide, bone, plant material and a few more. That kind of information is perhaps very broadly comparable to studies by physical anthropologists of dental wear patterns, or their analysis of the chemical content of bones, when they seek to reconstruct human diet.

Other examples could be given, but we can fairly conclude that the evidence of stone artefacts has much to offer the student of human evolution and early human migration. But I have a sense that, at the moment, there is to some extent a needless atmosphere of competitiveness and perhaps even mutual suspicion between human palaeontologists and archaeologists, when really they need each others' contributions as never before. It is only to be expected that I, as an archaeologist, should view this from the side of archaeology, and should feel that those whose chief concern is with discovering artefacts and extracting the maximum information from them are in certain circles perceived as second-class citizens. Research funding and publication are two risk areas: why should it need the discovery of a human bone fragment or a couple of teeth to make the grants and attention flow in for a Palaeolithic site that has also produced highly informative artefacts, and environmental evidence, both in abundance - as we saw, for example, at Boxgrove, in England (Roberts *et al.*, 1994)? And I wonder whether we should all be here to confer about Dmanisi today, if there were no hominid mandible amongst the finds? As regards the matter of publication, I will simply offer the example of the journal *Nature* and invite you to consider the papers it has accepted and rejected over the past ten or twenty years that are relevant to the study of the opening stages of the human story - let us say from the late Pliocene down to the end of the Middle Pleistocene. One would expect and indeed applaud the rapid publication of every major hominid fossil find, but what about the rest of the evidence? Pure archaeological contributions are almost entirely absent - a fine exception was the report by Hartmut Thieme (1997) on the magnificent wooden hunting spears from Schöningen in Germany. Usually, any archaeology that actually appears does so under heavy escort from physical

anthropology, and all the editorial interest seems to be in the relatively small number of sites where hominid remains have come to light, enabling sometimes rather speculative and temporary assertions to be made about human evolution. There seems to be no corresponding concern with human activities. What was the point of all that dedicated evolving by the early hominids, if they and their successors were not going to indulge in some interesting and researchable behaviour and activities, whether it be making the first migrations to the Gates of Europe, or exerting an iron control on the editorial policies of international journals?

For human behaviour and activities in the opening phase of the Palaeolithic period, the majority of the evidence is likely to be provided by artefacts and the contexts in which they occur. Many excellent examples already exist. Let us here in Georgia resolve to consider fairly and equally all the classes of evidence that can help us to understand the origins and dispersal over the Old World of the earliest humans.

Examples and illustrations

In addressing the conference, I began by emphasising the point that the occurrence of undoubted artefacts constitutes clear and important evidence for human presence, whether or not hominid remains are found with them. It being the end of a long and hard-working conference, I even made the somewhat outlandish but perfectly valid point that an actual (if temporary) human presence on the Moon during the later 20th Century AD could be clearly demonstrated by future archaeologists, from careful consideration of the artefacts abandoned on the moon's surface, adding the rather more speculative comment that I doubted whether, if they offered a paper to *Nature* on their work, it would be accepted, because they would have recovered no hominid remains with the artefacts. More relevantly, I turned to the site of Orce, in southern Spain, showing a slide of the controversial bones claimed to be hominid, and several of the contemporary artefacts and the excavations that produced them at the sites of Fuentenueva 3 and Barranco León. The artefacts' genuine nature is clear (Roe, 1993; Tixier *et al.*, 1995; Turq *et al.*, 1996; Gibert *et al.*, 1998b), and indeed was never questioned by the 200 or more participants at the 1995 Orce Congress. They constitute unassailable evidence for human presence in a southern extremity of mainland Europe during the Early Pleistocene, on a minimal view somewhat earlier than 1.0 m.y.a., and accordingly they are a find of great significance to all students of the human past.

To illustrate the special kinds of information which stone artefacts can yield about the abilities and behaviour of their makers, I next showed some slides of the distinctive microwear traces that develop when flint edges are used to process various substances, such as bone, plant material or hide. The classic approach of the microwear analyst is to create such traces by controlled experiment, and to use the resulting 'reference collection' to interpret the microwear patterns preserved on actual archaeological material. Clearly, the raw material of which the experimental pieces are made must correspond closely to that of the originals, and the study involves far more than the simple examination of microwear 'polishes', since a tool is affected in many ways when it is used (cf. Mitchell, 1998). Microwear analysis can yield remarkable results, and it is also worth remembering that it can on occasion be applied to artefacts of very early age, as it was at Koobi Fora, Kenya (Keeley & Toth, 1981; Keeley, 1997). I then referred to the conjoining of artefacts and the highly productive *chaîne opératoire* approach, which can not only tell us a great deal about lithic technology, and the economic side of raw material procurement and use, but can also on occasion enable us to study directly the mental processes of humans at work, in this case craftsman knappers. Surely, such information should be of interest to anyone concerned with the evolution of the human brain and the progress of human cognition, whatever may be the discipline within which they themselves address the topic? Seeking a single example of the kind of detailed information that can be obtained when the conjoining of fresh artefacts is combined with microwear analysis, I chose an old favourite of mine: the picture presented by Cahen and Keeley of the knappers and bone-workers at Meer, Belgium (1980; see also their contributions in Van Noten, 1978).

Finally, I spoke briefly about the British Lower Palaeolithic site of Boxgrove, Sussex, and showed half a dozen slides of the finds there, drawing together many of the points previously made. At Boxgrove, large numbers of artefacts occur in extremely fresh condition, with some important clusters preserved at different points on an extensive Early Middle Pleistocene land surface (Roberts, 1986; Roberts *et al.*, 1997; Pitts & Roberts, 1997; a monograph edited by M.B. Roberts and S.A. Parfitt is in the press for publication in 1999). There are knapping places and also working areas, particularly places where animals such as rhinoceros, horse and deer were butchered: the evidence includes cut marks on animal bones and microwear traces appropriate to

butchery on the edges of flint artefacts, especially handaxes (Mitchell, 1996, 1998). A whole variety of evidence has also permitted a detailed reconstruction of the local topography and environment during the human occupation. By British standards, and indeed on a far wider scale than that, this is a quite exceptional Lower Palaeolithic site, and the prolific stone artefacts have yielded rich information, both by their own nature and from the contexts in which they occurred. Yet I had to conclude with the observation that only after a fragmentary hominid tibia tentatively assigned to *Homo heidelbergensis* was discovered in 1993, followed later by two teeth, did Boxgrove receive attention on a massive scale, an appropriate injection of funding and - yes - even coverage in *Nature* (Gamble, 1994; Roberts *et al.*, 1994).

Concluding comments

To anyone with more than a passing interest in the study of stone artefacts, the foregoing text should contain few surprises. But it is remarkable how frequently one may encounter the view, usually not very carefully considered, that stone artefacts are not worth studying in these enlightened times, because there is nothing one can learn from them beyond typology and technology. That may well have been true up to the middle years of the present century, but several decades of research since then have been carrying artefact studies forward in the directions I have sought to indicate, and the progress has not come to a halt: indeed, it is tending to accelerate. Microwear analysis, for example, after a rather stagnant period, has recently benefitted greatly from a new generation of microscope technology and from direct linking of microscopes and cameras to computing equipment in ways that could not have been imagined a few years ago (see for example Mitchell, 1998). Yet all the advances still depend on the availability of high-quality artefact assemblages to study, and it is part of the work of the Palaeolithic archaeologist to provide these. Typology and technology have not gone away, of course: they remain as essential starting points when any artefact assemblage comes to be studied, but so much more is now possible beyond them.

Dmanisi was a very impressive site to visit, and the finds it has already produced are of the greatest importance. One of the surprises at the conference, to me at least, was the immense quantity of the stone artefacts that have been recovered: over ten thousand, where I had somehow expected only a few hundred, perhaps because there had been few published illustrations. It was explained to us that

they do not seem to be in an undisturbed primary context, though many are fresh, but they clearly offer a wonderful opportunity for detailed study. Typology and technology will once again be the starting points, and the consistently simple nature of both at Dmanisi (if the specimens displayed to the conference are a fair guide) requires an explanation. But it is very much to be hoped that the whole assemblage will offer far more opportunities than that, as the work proceeds. With all the geological and sedimentological evidence, the excellent faunal remains, and the superb hominid fossil finds, plus the abundant artefacts, Dmanisi is a crucial site for the study of early human migrations, and I am sure the research team will ensure that the final output of information is indeed the result of what I have advocated here: using all the evidence.

On re-reading at proof stage my comments about the chances of *Nature's* accepting an article concerning early stone artefacts, I feel I may have been too pessimistic. Doubtless the chances of acceptance would be greatly enhanced if one could somehow include word *Drosophila* in the title: difficult, of course, but perhaps not impossible.

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