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## On Zhoukoudian

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# DISCUSSION AND CRITICISM<sup>1</sup>

## On Zhoukoudian

by RICHARD S. DAVIS

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Binford and Ho (CA 26:413–29) do the archaeological community a service in opening questions concerning the degree of associative patterning and cannibalistic activity at Zhoukoudian. Many investigators will certainly agree that the taphonomic role of carnivores has been largely overlooked in the interpretation of the hominid and faunal remains, but, as the authors are aware, taphonomic analysis based only on the literature is by itself inconclusive no matter how plausible. The depositional history of the venerable cave cannot be teased out of published accounts.

For some time Binford has been making the case that Lower and even Middle Paleolithic hominid behavior was organized in a way qualitatively distinct from the one we commonly associate with modern *Homo sapiens sapiens*. It follows that untempered analogical reasoning relating modern to Middle Pleistocene ways of life is bound to lead to no good end. Nevertheless, Binford and Ho have not deculturated Peking man as much as they seemed to be about to, and my basic understanding of the Zhoukoudian situation has not been vastly altered as a result. They conclude that Middle Pleistocene stone-tool-making peoples occupied the cave at intervals over a 200,000-year span, used fire, and had a diet of unknown proportions of plant and animal foods. It seems to me unreasonable to conclude that none of the animal bone came to the cave as a result of hominid hunting or scavenging, and as far as I can tell Binford and Ho do not draw that conclusion. Their characterization of the Zhoukoudian behavioral system as a “noncultural form of adaptation that is strongly tool-assisted” seems a contradiction in terms. I don’t see why these Far Eastern *H. erectus* were not within the cultural domain. Of course, if Binford and Ho’s definition of culture includes symboling, then it would be hard to bestow cultural status on any Lower Paleolithic and few Middle Paleolithic manifestations; even many Upper Paleolithic sites lack evidence of symbolic behavior. I think a more operational definition of culture for archaeologists would be useful. In any case, it would be interesting to learn more about how a “tool-aided, somatically transmitted and conditioned behavioral system” works.

Binford and Ho’s interpretation of the shifting entrance in Member 2 seems promising for further investigation, and it does call into question the role of the hominids in bringing in the accumulated fauna. I don’t understand, however, given their assumption that hominids tended to live near entrances of caves, how the stone tools got to Locus G, Upper Layer 8, some 29 m into the cave. Also, do hyenas commonly exhibit their denning behavior so deep in the interior of caves?

Zhoukoudian is one of Paleolithic archaeology’s foundation stones, and Binford and Ho have shown that its traditional interpretations are seriously flawed. They point the way to a fruitful reexamination of the cave, and I look forward to learning the results of new field investigations.

by C. B. STRINGER

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First I would like to congratulate Binford and Ho on a good critical review of the data concerning Zhoukoudian. Of course,

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an assessment of the validity of their criticisms and further clarification can only really come with further detailed study of the site and the surviving excavated materials, but they have highlighted some of the major problems which need to be addressed. Their caution regarding the role of humans in producing bone or other accumulations in Pleistocene caves is welcome and still all too rare. From my involvement with British sites I certainly feel it would be more realistic, and ultimately more informative, if all excavators at supposed Lower Palaeolithic sites made the initial assumption that early humans had made *no* impact on the sites. Clear demonstrations to the contrary would depend on the elimination of other likely causes for accumulations of bones, “ash” deposits, etc., or the recognition of positive evidence for human activity (e.g., probable cut marks, presence of artificial structures, etc.).

Regarding the role of carnivores in producing bone accumulations, a few cautionary remarks could be added. First, I am sure that by talking of the behaviour of “the hyena” the authors do not mean to imply that the different fossil and living species of *Hyaena* and *Crocota* had or have only one kind of behaviour regarding denning, bone collection, bone modification, etc. Caution is apparent in n. 24, and I can confirm that several British *Crocota* sites show extensive evidence of bone modification and sometimes rather different bone assemblage composition to those indicated here, for example, in the higher frequency of long bones and metapodials and the lower frequency of vertebrae and cranial parts. Additionally, regarding n. 23, Sutcliffe (personal communication) *has* identified clear modification of the human crania collected by him from African localities in the form of characteristically bevelled edges around the calottes recovered.

Regarding Zhoukoudian itself, Kenneth Oakley in 1951 acquired some bone and sediment samples collected by Breuil from Locality 1, labelled by him in 1938. These include “burnt” and “unburnt” bones and a small sample of “burnt cave earth,” all from “the *Sinanthropus* layers.” G. Jones and F. Wall of the Mineralogy department, British Museum (Natural History), kindly agreed to analyse samples using electron microprobe and CHN analysis with particular reference to the presence of free carbon or manganese as an indication of burning or staining. Analyses were conducted on a small fragment of “burnt” bone (dark brown-black resinous in appearance [which I shall term A]), a piece of “humanly fractured” bone (mottled grey and black but not obviously burnt [B]), and a small sample of “burnt cave earth” (a light-brown silty deposit containing fragments of quartz, calcite, and a few dark particles [C]). Manganese was not detectable in any of the samples, and free carbon (ca. 8.4%) was present only in Specimen A, which is probably genuinely burnt. Sample C, potentially of the greatest interest here, was predominantly a mixture of apatite with associated carbonate and illite (potassium aluminium silicate). It was similar to Specimen B in chemical composition and rather than representing an ash deposit seems more likely to represent a mixture of bone debris and cave sediment.

However, a few dark organic fragments were present in Specimen C, and these were submitted to A. Currant (palaeontologist), C. Hill (palaeobotanist), and P. Whalley (entomologist) for microscopic examination. One represented an unidentifiable tooth fragment of a mammal, one was a minute fragment which may have derived from a beetle, one was a minute piece of charcoaled wood (probably coniferalean), and the last was a carbonised leaf fragment bearing apparent stomata. Evidently there *is* evidence of both burnt wood and bone from the Breuil 1938 collection. This preliminary examination of a small sample from Zhoukoudian gives an indication of what information could still be retrieved from the surviving material (e.g., the remaining Breuil collection in France) if it could be analysed by appropriate specialists.