Current events

The modernity mess

Milford Wolpoff &
Rachel Caspari
Department of Anthropology,
University of Michigan, Ann Arbor,
MI 48109-1382, U.S.A.

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When we had the good fortune to study the Klasies River Mouth Cave remains at the South African Museum in 1989, the isolated partial zygomatic KRM 16651 presented us with a morphometric challenge. The face of the bone appeared quite large, but only a small portion of the inferior border was preserved, and that mostly under the temporal process. No measuring points allowed standard comparisons to be made for the size of the zygomatic face. However, comparing it with other more complete specimens, we felt a conservative interpretation placed the inferior edge of the medial break close to the zygomaxillary suture (the interpretation is conservative because if we assumed the break was further from the suture, the size of the bone we estimated would be larger). The orbital rim, zygofrontal suture, jugal notch, and superior zygotemporal suture allowed us to place the fragment on complete specimens *in proper orientation*; we used the crania of our comparative sample of Holocene populations from the Southern Cape, and casts of African fossils. We did not want to guess at the position of the *zygomaxillare* (*zm*) point, so instead we knowingly underestimated the vertical distance of that point to the orbital rim, in Frankfurt Horizontal, by taking the vertical distance from the most inferior point of the bone. We knew this would *under*estimate the true measurement that would be taken had the *zm* point been preserved. We did this a number of times, using different specimens for orientation, and recorded (and reported) a distance of greater than 30 mm. With assertions and figures, Bräuer & Singer (1996) argue this is incorrect and that the specimen is much smaller. This is important in their train of evidence that Klasies is an anatomically modern human sample.

We did not mismeasure or misreport, and although we do *not* believe that the size of the zygomatic face is critical in considering whether the Klasies *sample* is modern, we want to briefly show why our anatomical assessment is the correct one. To avoid problems of picturing specimens to different scales, or in different orientations, we present in our figure, a picture of the KRM 16651 cast, in the same frame as a cast of the left zygomatic for Kabwe, cut to present the same portion as the Klasies specimen preserves. According to the data reported by Bräuer & Singer, Kabwe is larger than the Klasies specimen; according to the results of our measurements it is smaller. Although we usually abhor this phrase, the figure speaks for itself.

We hope focus can now return to the real question—the modernity of the Klasies *sample*. This question can not be separated from a deeper one—what does it mean to be modern?—the question that is at the heart of these human origins debates. Because it is variable, the interpretation of the Klasies sample is entirely dependent on what one thinks ''modernity'' is, and, therefore, there is a real danger of circularity if the broader issue is not reckoned with.

Even if we concentrate on the putative modern *features* at Klasies, absence of supraorbitals for KRM 16425 (though it is possible that the specimen is juvenile) and the chin of KRM 41815 [though it might be an artefact of a strong incisure (the concave area on the symphysis

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Figure 1. Zygomatic faces of KRM 16651, as preserved, and Kabwe, cut to show the same portion of bone. Both specimens are casts. The Klasies specimen is to the left. The measurement we reported shows Klasies to be the larger zygomatic; Bräuer & Stringer (1996) assert it is smaller.

face between the mental eminence and the alveolar margin) caused by alveolar resorption due to anterior tooth loss], the issue remains whether a few modern features make a *sample* modern. They might mean modernity, for instance, *if we began with the assumption that modern humans were a new species, and these were its autapomorphies*. But let us not begin by assuming our conclusions.

The Klasies *sample* has archaic features found in *no* modern populations. For instance, cross-cutting the size differences, both the largest and smallest mandibles completely lack chins. In fact, of the four symphyses preserved, two (KRM 13400 and 14695) lack even a mental trigone and a third (KRM 21776) has only a weakly developed trigone (similar Neandertals are called ''chinless''). These symphyses, the large zygomatic face and its thick frontal process, and the marked innerorbital breadth of the frontal, are very far from the modern condition (Caspari & Wolpoff, 1990; Wolpoff & Caspari, 1990; Smith, 1992). This mixture of archaic and modern features is exactly what one would expect in a transitional sample, one in the process of evolving into moderns (Trinkaus, 1993). We agree that these considerations make good sense, *but only in the context of an evolutionary model, in which modernity appears gradually, with its elements slowly increasing in frequency*.

Whether modernity evolved suddenly or gradually, if a single origins theory is correct, a transitional sample such as Klasies would only be expected in one place—where modernity evolved. And it would only be expected at one time, before the modern populations spread. This is because applied to ''Out of Africa'' formulations, a superior group sweeping around the world *explains the spread* of modernity. Furthermore, single origin theories account for the predominance of the early modern Africans, as they dispersed, *by* their modernity. Modernity,

in this account, is a package of very successful, interacting anatomical features and behaviors, whose genesis is at its origin. The modern populations have better adaptations, mixing with (and swamping, according to the Afro-European *sapiens* hypotheses) or totally replacing (according to the Eve hypothesis) native indigenous peoples because of the advantages their modernity confers.

Here is the problem. A population such as represented at Klasies, only showing a few modern features, mixed with archaic ones (Singer & Wymer, 1982; Rightmire & Deacon, 1991; Bräuer *et al.*, 1992), and no particularly modern behaviors (Klein, 1989; Thackeray, 1989), could at best be considered a transitional forerunner of later-evolving moderns in an ''Out of Africa'' formulation. But Klasies is too late for this, as there were already populations elsewhere, described as ''fully modern'' by single origins theorists. Klasies is the same age as Qafzeh (Bar-Yosef & Vandermeersch, 1993), which is a much more modern-appearing sample. At Qafzeh, for instance, all the mandibles have chins (Vandermeersch, 1981). By most accounts Klasies is younger than Jinniushan (Pope, 1992*a*; Chen *et al.*, 1994), where a very modern facial anatomy is found in a specimen with the earliest known large, thin boned cranial vault (Pope, 1992*b*).

However, we reject the notion that one of two penecontemporary samples with modern features, such as Klasies and Qafzeh, actually could be more modern than the other. One could only be more modern if modernity evolved in a single place, and this brings us back to what we mean by modernity and how we can diagnose it. In our view this diagnosis, if possible at all, must be regional, since geographic variation can confound assessments of temporal trends. For example, many of the features considered diagnostic of modern humans reflects increases in gracilization (reduced size and muscularity). Specimens from areas of the world that exhibit elevated levels of robustness, for instance the cranial robusticity of indigenous aboriginal native Australians, can appear to be archaic, whereas those with more gracile regional features will appear more modern than their contemporaries elsewhere. The interpretations of Klasies have fallen victim to just this problem. Some of the modern features in the Klasies specimens are mainly a consequence of their size, since small size generally creates gracility. For instance, some of the gnathic remains are small and gracile—especially the AA43 and ZZ44 maxillae and the KRM 14695 and 16424 mandibles; others are much larger. Postcranial remains are diminutive as well, among the earliest in *Homo sapiens* to be Khoisan-sized (Rightmire & Deacon, 1991). We think that this probably contributes to the impression of modernity in some specimens because smallness usually creates skeletal gracility. But small sized ancient populations with gracile features are not necessarily more modern than their larger contemporaries, any more so than present day gracile populations are more modern than present day robust ones. It is all too easy to confuse regional and temporal characteristics.

The main problem with modernity, we think, is reflected in the fact that there is no worldwide definition of moderns that simultaneously includes all modern humans and excludes all archaics. If modern humans share a recent unique origin, definition of this group should be possible. However, it may not be possible if the multiregional model is correct. Regional considerations show that the range of modern variation for all of the features deemed taxonomically relevant for modern humans actually encompasses the way these traits are expressed by many fossils. For example, modern human populations range from including people with large brow ridges to including people with none at all. Although it may be instructive in a regional context, brow ridge size does not indicate modernity. This relates to how one interprets the reduced supraorbitals of KRM 16425. It has smaller browridges than

many of its contemporaries, just as *living* Africans have smaller brow ridges than many of their contemporaries. If we apply the principle that the present is a valid guide for interpreting the past, the criteria we apply to interpreting human variation today would be used to interpret human variation 100,000 years ago, and brow ridge reduction at Klasies should not indicate that Klasies is more modern than its larger browed contemporaries.

In fact, we believe it is probably impossible to arrive at a definition of anatomically modern humans that simultaneously includes the variation of all living people and excludes all members of archaic groups (Wolpoff, 1986; Brown, 1990; Kidder *et al.*, 1992). A populational approach to understanding the place of modern features in archaic populations suggests that even as they appeared, and as they increased in number and frequency, modern features were only part of the normal variation of populations. Were the people who possessed them more modern than their siblings that did not? Of course not. Any meaning of moderns, therefore, must encompass many ancients, and make it seem as though, for long periods of time, archaic and modern people were co-existing, not just on the same continent, or in the same region, but in many cases, within the same family.

More important than, and critical to, the issue of how to define modernity, we think, is understanding the evolutionary processes that produced it. Modernity, the way we look at it, was not the appearance of a set of anatomical details, but a process and a pattern of change. We liken the process to throwing stones into a small pond. The ripples from each strike and interact with each other. It is not the modern features and behavioral innovations, the ripples, that create modernity, but rather, the interference patterns created as they overlap that define modern humanity, a definition based on variations in different regions. Each region is different, and, yet, it is a singular process that unites them, diffused through the interconnections between the populations. Each set of ripples spreads over the entire pond and guides the evolution of the species, but the angles and intensities of the ripples differ from place to place, and so their interactions create different patterns.

It is ironic that the only way Klasies *could* be validly interpreted as a sample of modern humans is in the context of multiregional evolution. As such, it would join ''modern'' samples from regions as far away as the Levant, North China, and Southeast Asia (Caspari & Wolpoff, 1995), to show that the appearance of modern features are, regionally anatomically diagnosable, but modernity is undefinable on a worldwide basis. Yet, although all these samples differ from more archaic predecessors, we question whether any of them can be considered truly ''modern''. None of them possess the suite of features or behaviors that characterize humans of the recent past. We feel that this quest for the beginnings of modernity is doomed to failure; we are seeking something that doesn't exist. It is time, as P. V. Tobias recently said, to stop talking about ''anatomically modern humans'' for the same reasons that we don't talk about ''anatomically modern elephants''. And, we propose, it is time to stop publishing papers about the evolution of ''anatomically modern humans'' unless they include a definition of them.

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