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## On Neanderthal Crania and Speech: Response to Lieberman

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In "On the Kebara KHM 2 Hyoid and Neanderthal Speech" (CA 34:172-75), Lieberman quotes without permission from an unpublished manuscript. Referring to my work on the cranial base of Neanderthals and later Europeans (p. 174), he cites an abstract in the *American Journal of Physical Anthropology*, but the issue he addresses (the Weicker [sic] angle) and other details of his criticism do not appear there, nor were they discussed in my presentation of the research at the 1992 meeting for which the abstract was prepared. The source for these comments is a manuscript that I submitted to CA a year ago and on which Lieberman served as a referee, in which I said, "The Welcker angle is not comparable to the basal profiles generated by Laitman, Heimbuch, and Crelin (1979). This is because the Welcker angle crosses into the neurocranium and measures a different

aspect of craniobasal flexion." The manuscript was eventually rejected, and I now find myself associated in print with ideas that I was not allowed to publish. I would prefer to have had the opportunity to state my own position.

## On the Evolution of Speech: Singing as the Middle Term

BRUCE RICHMAN

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Burling's (CA 34:25-37) categorization of human vocal behaviors into two opposed systems, expressive sounds and speech, overlooks an important and widespread human vocal behavior that lies halfway between them: singing. Much human singing involves the rhythmic and melodic chanting of nonsense syllables; in fact, in some cultures, such as the !Kung and the Mbuti, many songs have no text. Singing is used to accomplish many social, political, religious, interpersonal, and aesthetic ends. It is hard to imagine a human society with no lullabies, no nursery rhymes, no singing games, no political anthems or religious hymns.

Burling says that the crucial difference between the human expressive sound system and speech is that sounds such as sobs and laughs are *analog* (i.e., directly iconic of emotional states) and grade continuously one into another, whereas speech is part of a system that is *digital* and contrastive throughout. Where does singing fit in? As far as vocal physiology is concerned, it seems very much like speech in that rhythm and melody—intonation—are essential to both. It does appear, however, that singing and speech are organized somewhat differently: some people who stutter while speaking can sing quite fluently. The rhythm and melody of speaking are more improvised, and anxiety about taking the solo speaking turn can lead to stuttering. As far as their purposes and functions are concerned, singing and speech seem very different; singing obviously does not convey specific conceptual information as words and sentences do. In addition, I suggest that singing is more directly expressive of emotions than speech. Like shared sobbing and laughing, group singing gives the participants a strong, direct feeling of social cohesion and solidarity; speaking together does not necessarily produce such a feeling. The choral aspect of group singing is different, however, from the choral aspect of sobbing or laughing: whereas sobbing and laughing are merely socially infectious and imitative, choral singing is rule-governed. The rhythms and melodies of singing are highly articulated: they are broken up into discrete and contrasting parts (melodies being based upon contrasts of tones, rhythms on contrasts of kinds of beats and time placements) and organized sequentially according to those contrasts.