

## 8. How different were Neanderthals' habitual activities? A comparative analysis with diverse groups of recent humans

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### Abstract

The lifeways of Neanderthals remain poorly understood despite numerous hints from the archaeological record and from Neanderthal anatomy that their lifestyles may have differed substantially from early modern humans and from more recent populations. The distinctiveness, inefficiency, or primitiveness of Neanderthal lifestyles and patterns of activity play a central role in many adaptive scenarios that have been proposed to explain the eventual ascendancy of modern humans and the Neanderthals' demise. However, many recent studies of faunal remains accumulated by Neanderthals, stable isotope analyses of Neanderthal bones, and the energetic demands of their large body mass suggest that these archaic humans were equally efficient hunters as fully modern foragers in similar environments. This contradictory evidence inspired the present study. To gain new insights into Neanderthal behaviors we use a comparative approach, examining indices of residual bone strength and midshaft diaphyseal shapes of the humerus, femur, and tibia in several groups of Neanderthals (European and Near Eastern), early modern humans, and sixteen diverse groups of recent humans. The results indicate that Neanderthal limbs bear a close similarity to a fairly wide spectrum of more recent groups, especially those who practiced intensive forms of foraging within fairly limited territories. The Neanderthal pattern differs strikingly from those of Skhul-Qafzeh and Gravettian humans, but these early modern humans also differ substantially from the later, intensive foragers. These results are probably more indicative of the relative distribution of people to resources in the Mousterian than the relative behavioral *capacities* of modern humans and Neanderthals.

## Introduction

This paper presents an attempt to gain insights into the habitual activities of Neanderthals and their contemporaries, early modern (or nearly modern) humans in Israel, and anatomically modern humans from the Upper Paleolithic of Europe. This topic has been intensively investigated in the two decades since Trinkaus' (1983a, 1983b, 1984) synthesis of functional differences between Neanderthals and early modern humans, but a variety of recent studies have suggested that aspects of that synthesis may be incorrect and could profitably be revisited (Gaudzinski, 1999; Grayson and Delpech, 2002; Sorensen and Leonard, 2001; Pearson, 2000; Ruff, 2000a).

Anthropologists have long noted anatomical differences between Neanderthals and modern human postcranial skeletons. Endo and Kimura (1970; Endo, 1971) led the way by focusing attention on the functional implications of many of these differences, a theme that was elaborated upon later (e.g., Heim, 1982; Trinkaus, 1983a). Among those differences were the presence of well-developed femoral pilasters in early modern humans in contrast to nearly circular cross-sections of Neanderthal femora (McCown and Keith, 1939; Endo and Kimura, 1970; Trinkaus, 1976; Vandermeersch, 1981), and a marked "flattening" of the mid-shaft of Neanderthal humeri (Endo and Kimura, 1970; Heim, 1982; Trinkaus, 1983a). Endo and Kimura (1970) were the first to apply the principles of modeling the cross-sections of limb bones as bent beams in order to gain insights into the biomechanical strength of Neanderthal bones, and were soon emulated by others (Lovejoy and Trinkaus, 1980; Senut, 1985). By the 1990s, much of the work on functional adaptations in Neanderthals shifted to analyses of cross-sectional geometry.

The background for the present study thus begins in the mid-1980s, with Trinkaus' view of Neanderthals as extremely active and immensely strong foragers whose lifestyle – and

presumably a long history of selection to allow them to efficiently follow that lifestyle – was reflected in the robusticity of their long bones, the sizes of certain muscle markings, increased leverage available to specific muscles, the thickness of the cortical bone in their limbs, and a variety of other features found throughout the skeleton. Trinkaus' (1983a, b, 1984) emphasis on anatomical and, by extension, inferred behavioral contrasts between Neanderthals and modern humans proved to be both very influential and long lasting. The view of Neanderthals as inefficient foragers who needed great physical strength and endurance to survive was heavily influenced and substantiated by Binford's (1985, 1989) conclusions that the faunal record of Neanderthals, and even contemporaneous early moderns from the Middle Stone Age of South Africa (Binford, 1984), did not show many signatures of the behavior of ethnographically documented hunter gatherers, including spatial organization within occupation sites, planning depth as indicated by the excavation pits or other features for storing food at occupation sites, the use of special purpose sites, and frequent curation of high-quality tools or raw material.

Interpretations of Neanderthal behavior have gone through numerous swings from an emphasis on their behavioral differences from modern humans to emphasis upon their similarity with modern humans (Trinkaus and Shipman, 1993). There have always been disagreements about how "modern" or "archaic" Neanderthal behavior was, and a variety of scientists disagreed with aspects of Binford's synthesis of Neanderthal behavior, as well as other contemporary scientists whose syntheses emphasized the distinctly "non-modern" character of the Neanderthal archaeological record (e.g., Mellars, 1996, 2004b; Klein, 1995, 1999, 2003). Among these dissenting voices was Chase (1986), who noted that the faunal remains from Neanderthal hunters at Combe Grenal did not differ substantially from similar