

Neanderthal News: Extinct Species Exhibits Variability

Continuity and Discontinuity in the Peopling of Europe: One Hundred and Fifty Years of Neanderthal Study, Volume 1. Edited by S. Condemi and G.-C. Weniger (2011) New York: Springer. 398 pp. \$139.00 (hardcover) ISBN: 978-94-007-0491-6

Neanderthal Lifeways, Subsistence and Technology: One Hundred and Fifty Years of Neanderthal Study, Volume 2. Edited by N.J. Conard (2011) New York: Springer. 308 pp. \$139.00 (hardcover) ISBN: 978-94-007-0414-5

Becoming Neanderthals: The Earlier British Middle Palaeolithic. By Scott B. (2011) Oakville, CT: David Brown Book Company. 248 pp. \$100.00 (hardcover) ISBN: 978-18-421-7973-4

The Paleanthropology and Archaeology of Big-Game Hunting: Protein, Fat or Politics?. By Speth J. D. (2010) New York: Springer. 358 pp. \$169.00 (hardcover) ISBN: 978-14-4196-732-9

What is it about the Neanderthals? No other extinct hominin captures the popular and scientific imagination the way the Neanderthals do. Virtually every aspect of their being, their origins, behavior, appearance, interactions with other hominins, extinction (or survival?) is passionately debated not just among scientists, but also the interested public. Their fate has been the subject of immensely popular novels, several films, and countless television documentaries. There have even been serious calls to “revive” them by using fossil DNA. Why is it that people care so much more about these later Pleistocene fossils than they seem to about earlier hominins? At most, the Neanderthals are ancestral only to some of us. Earlier hominins, like *Homo heidelbergensis* or *Homo erectus*, are ancestors of all of us. Why is it that the Neanderthals are, as Trinkaus and Shipman¹ aptly put it, “images of ourselves”?

Homo neanderthalensis lived in western Eurasia between 250–30 Ka. Most of their habitation sites and fossils are associated with faunas from temperate woodland and steppe habitats. The limits of their eastern range are unclear, with the southernmost fossils coming from Israel and the easternmost from Uzbekistan. Neanderthal crania are distinct in featuring a divided brow-ridge, pronounced mid-facial prognathism, a projecting occipital bone, and teeth with enlarged pulp cavities and incompletely divided roots. Below the neck, the Neanderthals were ruggedly built, with thick cortical bone, enlarged joint surface areas, a barrel chest, wide pelvis, and relatively short distal limb segments. Some of these features occur piecemeal among European *H. heidelbergensis* fossils dating to ca. 300 Ka, and not in their African counterparts. This suggests the Neanderthals evolved in western Eurasia. The last appearance dates for Neanderthal fossils range between 45 Ka in the East Mediterranean Levant and 28 or 30 Ka in Iberia. The presence of Neanderthal features among some European Upper Paleolithic *H. sapiens* fossils, as well as the difficulty of discriminating between Neanderthal and *H. sapiens* fossils from Southwest Asia has long fueled hypotheses of gene flow between the Neanderthals and early *H. sapiens*. These continuity hypotheses have found support from analyses of aDNA from fossils and variation in the DNA of living humans, suggesting that some significant portion of Eurasian humans, and possibly some North Africans as well, have genes that are traceable to Neanderthal ancestors.

Neanderthal fossils are associated with Middle Paleolithic “Mousterian” stone-tool assemblages and a handful of so-called “transitional” Middle-Upper Paleolithic industries, mainly from Mediterranean Europe. Neanderthal sites differ from those of

their *H. heidelbergensis* predecessors in showing abundant evidence of controlled use of fire. Faunal remains from Neanderthal sites preserve evidence of a broad diet that included birds, fish, shellfish, reptiles, and small mammals, as well as large terrestrial mammals ranging from gazelle and ibex to aurochs, bison, rhinos, and mammoths. As among sites of roughly contemporaneous *H. sapiens*, there are occasional finds of mineral pigments, perforated shells, modified bone tools, burials (sometimes with mortuary furnishings), and occasional evidence of cannibalism (inferred from cut-marks and bone breakage). Such symbolic evidence as has been claimed for Neanderthal and early *H. sapiens* contexts before ca. 40–50 Ka share a quality of idiosyncrasy, rarely taking the same form at more than one site. Compared to contexts associated with Pleistocene *H. sapiens*, Neanderthal contexts lack evidence of nonculinary pyrotechnology, such as heat-treatment of stone or the production of ceramics; complex projectile technology, such as bow and arrow, spearthrower, and dart; figurative and abstract notation; ocean-going watercraft; freestanding architecture; food storage; or either plant or animal domestication.

Attaching the definitive article to any proper noun (“the Neanderthals”) or using a proper noun as an adjective (“Neanderthal sites”), as this review has done up to this point, inevitably shifts the focus of discussion toward modality and away from variability. And yet variability is of paramount evolutionary significance. Modalities in genotypes, phenotypes, and behavior are merely byproducts of selection on variability. One interesting theme emerging in recent books on Neanderthal paleoanthropology is increased recognition of variability in their fossil, genetic, and archeological records.

In 2006, it was 150 years since the discovery and recognition of the first Neanderthal fossil from Feldhofer, Germany. A pair of volumes in the Springer Vertebrate Paleobiology

and Paleoanthropology Series present papers from an international congress held in Bonn to celebrate this anniversary. Condemi and Weniger's *Continuity and Discontinuity in the Peopling of Europe* compiles mostly papers dealing with physical anthropology and genetics, but also papers looking at the big picture of Neanderthal paleobiology. Conard and Richter's *Neanderthal Lifeways, Subsistence, and Technology* groups together the archeological papers, those dealing with chronostratigraphy, subsistence, technology, and symbolic or cultural behavior.

The 49 papers in these two volumes provide an excellent snapshot of Neanderthal research at the start of the twenty-first century. No review can summarize them all adequately. This reviewer was particularly struck by the several papers in *Continuity and Discontinuity* that explored the origins of Neanderthals using newly discovered Middle Pleistocene fossils. In this, the Atapuerca Gran Dolina TD-6 (Spain) fossil sample is clearly key. It is almost unique in providing a rich sample of contemporary *H. heidelbergensis* individuals, among which one can see not only the evolutionary roots of the Neanderthal lineage, but also hints of other paths not taken in the European hominin evolution. Like us, Neanderthals were but one branch on a bushy Middle Pleistocene hominin family tree.

Several papers also report progress in sequencing the Neanderthal genome. One has mixed feelings about this development. On one hand, it has the potential to clarify the genetic basis for the morphological contrasts whereby we have for so long evaluated evolutionary relationships between Neanderthals and *Homo sapiens*. On the other, there is also the potential risk of "genetic reductionism," of seeing quantifiable genetic differences as the be-all and end-all of questions about Neanderthal paleobiology. Genetic differences account for little of the anthropologically interesting variability in recent human behavior. There is no reason to expect Neanderthal behavioral variability to be any less complex in loosely tethered genetics.

The contents of the archeology volume are mostly rather narrowly focused papers presenting evidence from particular sites or regions. There are a few exceptions: Gaudzinski-Windheuser and Roebroeks on subsistence in northern habitats, Bocherens on the stable isotopic record of Neanderthal diet, Kuhn on the organization of stone-tool technology, Gamble on models of Neanderthal social life, and Conard on the roots of the Upper Paleolithic in Central Europe.

Two recent monographic works, by Scott and Speth, highlight the importance of variability in models of Neanderthal behavior, but they do so in different ways. Scott starts with the archeological record and infers patterns of behavioral variability. Speth explores the sources of variability in particular behavior and follows up with their implications for archeology.

Britain usually does not figure prominently in these debates because there is a wide perception that, compared to adjacent parts of northwestern Europe, it was sparsely occupied. Scott's *Becoming Neanderthals* sets this record straight. While sites dating to Marine Isotopic Stages (MIS) 5-3 (127-71 Ka) are indeed rare, there are well-documented earlier Paleolithic sites in Britain that are referable to MIS 10-6 (364-127 Ka). Nearly all of these British sites are open-air sites, and many of them are sufficiently undisturbed by postdepositional processes to permit successful artifact-refitting studies and technological analysis of core reduction or tool curation strategies. Earlier contexts feature evidence of the production of handaxes and other large core-tools, but after 300-250 Ka these are joined by various "Levallois" techniques for detaching large flakes from hierarchically organized cores. In later contexts (128-40 Ka), handaxes eclipse Levallois products. Neither of these technologies replaces the other in a substitutional fashion; rather, they vary in relation to local geology or geography, raw materials, likely demographic factors, and cultural factors. Just as among recent humans, Neanderthals apparently chose to solve problems requiring

stone tools in response to situationally variable selective pressures.

Archeological and biogeoisotopic evidence clearly points to carnivory having a major role in Neanderthal subsistence. However, as Speth asks, what motivates hominin carnivory? There have been two major shifts in archeologists' thinking about the motives for hominin predation on large game. Early theories focused, appropriately, on nutritional returns. In the 1960s and 1970s, archeologists saw protein as the target resource but, as "middle-range" research involving nutritionists, ethnoarcheologists, and carnivore ethologists eventually showed, fat was as important as protein, if not more so, to hominin predators. Speth reviews a newly emerging focus on the social consequences of predation, increased social standing, and reproductive opportunities that accrue to successful hunters. As richly documented by ethnographic evidence, this work does not argue that social motives replaced nutritional ones, but rather, that as part of a battery of variable incentives, they gave rise to similar behaviors. A dead mammoth is a dead mammoth, whether it was killed for protein, fat, to "show off," or, more likely, all of these reasons. Where this relates to Neanderthals is that in modeling their behavior, paleoanthropologists have a longstanding habit of seeing it as a simpler, "primitive" version of recent human behavior. This book shows that more realistic models of Neanderthal behavior have to begin by assuming that the cost-and-benefit calculus governing that behavior was as complex as is observed among recent humans, unless there are principled reasons for expecting particular differences. No good scientific investigation starts by assuming that the null hypothesis is wrong. Whether the morphological differences thus far identified between Neanderthals and *Homo sapiens* justify such assumptions is likely to be the next frontier in Neanderthal paleoanthropology.

So what is it about Neanderthals? Why do we care so much about their place in human-origins research? Two hypotheses seem to fit the facts well. The "looking-where-the-light-is-

good" hypothesis holds that we care so much about Neanderthals because we know so much about them. Neanderthals were endemic to Europe and western Asia. This is where scientific human-origins research began and where it has been pursued for the longest period. As a result, there are more well-documented Late Pleistocene hominin fossils and Middle Paleolithic archeological sites in Europe and western Asia than in any other part of the world of equivalent extent. As a purely practical matter, Neanderthal fossils and their associated archeological record offer the richest database with which to test hypotheses about hominin paleobiology and behavioral variability.

The "venerable ancestor" hypothesis holds that we care so much about Neanderthals because they are plausibly ancestral to us. Reverence for ancestors is a human cultural universal. Some measure of scientific and

popular interest in Neanderthals may reflect their perceived ancestral status to Europeans and western Asians. Today, most hominin paleontologists and Paleolithic archeologists trace their origins to Europe and western Asia. (There is also a pragmatic dimension to this. Nobody has ever won accolades or attention for their fossil discoveries by trumpeting their status as evolutionary dead ends.)

Neither of these hypotheses is mutually exclusive, and both are potentially refutable. Human origins research in other parts of the world is beginning to catch up to Europe and western Asia. At some point soon, it will be possible to test paleobiological and behavioral hypotheses in other regions just as well as in western Eurasia. Will Neanderthals remain so central to paleoanthropology beyond this point? Similarly, as the number of paleoanthropologists

who do not trace either their cultural heritage or their biological ancestry to "Neanderthal country" grows, will scientific interest in Neanderthals be eclipsed by research on other Middle-Late Pleistocene hominins, such as those from East Asia or sub-Saharan Africa? Only time will tell. For now, new research increasingly casts Neanderthals as, to paraphrase Foley,² yet "another unique and variable species."

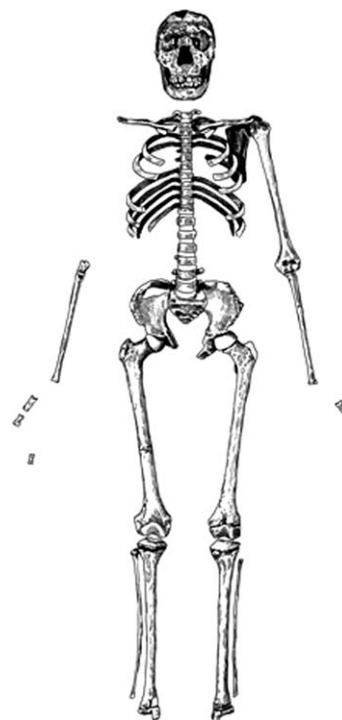
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