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Modern human dispersal into Eurasia: Preliminary results of the multi-disciplinary project on the replacement of Neanderthals by modern humans (RNMH)

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The RNMH (Replacement of Neanderthals by Modern Humans) project attempts to better understand the replacement process of archaic hominins by modern humans. This multidisciplinary project incorporates archaeology, palaeoanthropology, cultural anthropology, population biology, human genetics, chronology, paleoclimatology, neurosciences, biomechanics, and paleontology (Akazawa, 2012). Since 2010, the Archaeology Division of the RNMH project has been compiling an extensive archaeological database (Neander DB) to reconstruct the processes underlying modern human dispersal and the demise of archaic populations on a global scale (Nishiaki, 2012). The Neander DB covers the chronological period between c. 200 and 20 ka, spanning from Africa and across Europe, to Siberia, West, South and East Asia, and into Oceania. Toward a quantitative and qualitative comparison of the archaeological record left by different hominin species, the Neander DB establishes a comprehensive archive of site information [country, geo-coordinates, site type (cave, rock shelter, or open-air site), archaeological layer, archaeological entity, oxygen isotope stage, paleoenvironmental information, hominin fossils, organic artefacts, ochre, painting, ornaments, portable arts, radiometric dates, lab code, dating method, dating sample type, and sample taxon] (Kondo et al., 2012). A total of 2,082 sites have been registered in the database so far (as of May 28, 2013): 139 sites from Africa, 216 from West Asia, 720 from Europe, 468 from the former USSR and Central Asia, 492 from East Asia, 26 from South Asia, and 21 from Oceania. Altogether, these sites are represented by 4,567 cultural horizons and 5,605 radiometric dates. As the scientific approach underlying Neander DB addresses a long temporal range, it allows for a diachronic documentation of cultural changes, representing different hominin species through time. The database also encompasses a broad geographic region, enabling for great detail in tracing the process of modern human dispersal out of Africa. Both the chronometric dating and the geographic distribution of archaeological entities indicate that modern human populations equipped themselves with blade products based on the Levallois method, a technology that emerged in North Africa (Taramsan) around 60 ka and then dispersed into the Eastern Mediterranean Levant (Emiran) between 49 and 48 ka. Blade technology further expanded into Eastern and Central Europe (Bachokirian and Bohunician) between 48 and 45 ka and into Southern Siberia (Kara-Bom horizons 6 and 5) at around 47 ka. The rapid expansion of modern humans into Western and Eastern Eurasia followed by the demise of archaic populations in these regions may imply technological and cognitive advantages of modern humans. We investigate whether archaeological records from broader geographic contexts indeed demonstrate similar technological changes when modern humans encountered archaic populations, and attempt to reconstruct precise chronologies linked to paleoenvironmental proxies within the respective regions. This paper presents the preliminary results of the RNMH project.

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