Moravia at the onset of the Upper Paleolithic

Petr Škrdla

Czech Academy of Sciences, Institute of Archaeology, Brno

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THE DOLNÍ VĚSTONICE STUDIES, VOL. 23

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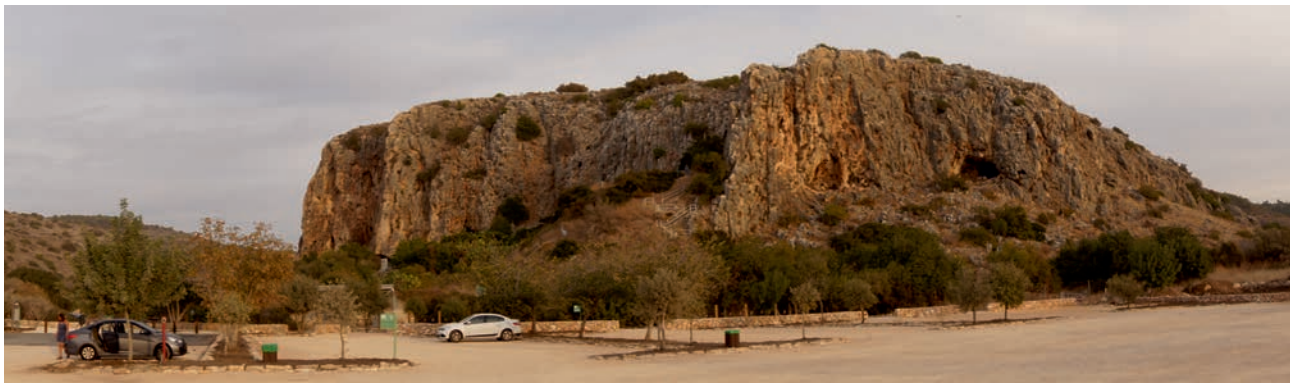
Prologue

Rapid advances in genetic analysis in the last decades have provided important insights into the genetic history of humankind. The analysis of mitochondrial DNA of living people in the 1980s had identified mitochondrial Eve – a hypothetical ancestor of all present day living women – who lived around 200 ka in Africa (Cann et al. 1987). In addition, paleoantropologists at the time also formulated a hypothesis proposing the spread of Anatomically Modern Humans (AMH from here) into the rest of the world and their genetic interactions with the local archaic populations – the Out of Africa hypothesis (Stringer, Andrews 1988), Multiregional Evolution hypothesis (Wolpoff et al. 1984), and Assimilation hypothesis (Smith et al. 1989). More recently, the completion of the Human Genome Project and sequencing of ancient Neanderthal DNA in particular allowed a comparison of both (Green et al. 2010). As the present-day Europeans and Asians share a small percentage of Neanderthal DNA in their genome, limited interbreeding between AMH and Neanderthals has occurred. The question is where it took place – one of the hottest candidates for that evolutionary event is the Near East, where both AMH and Neanderthals were documented during the time span ~120–80 ka BP before AMH spread into the rest of Eurasia. AMH groups expanding eastward to Eastern Asia and Australia met another Neanderthal derived population – Denisovans – and another interbreeding event resulting in an increase of 'archaic' DNA took place somewhere in Asia (Reich et al. 2010). The earliest European AMH fossil find from Pestera cu Oase contains 6–9% of Neanderthal DNA which suggests that interbreeding also took place in Europe (Fu et al. 2015). Although this particular population is extinct today, this finding shows that gene flow between AMH and Neanderthals continued around 40 ka cal. BP. Current advances in genetic analysis opened the door to a different level of analysis and confronted current archaeology with one of its greatest challenges – to connect the archaeological record with the genetic history that is written in our genome.

Denisova Cave, Altai District, Russia.

The earliest evidence of anatomically modern morphology is currently known from Jebel Irhoud in Morocco (Hublin et al. 2017), where human remains were recently dated to 315 ± 35 ka BP by thermoluminescence (Richter et al. 2017). There is only a narrow corridor connecting Africa to Asia – the Sinai Peninsula from where people followed a northern or a southern route (*cf.* Will et al. 2015). Somewhere in that area, the AMH and Neanderthals met each other resulting in a limited gene flow between both populations. The Near East is a nodal point on a hypothetical geographic route from Africa to Asia where both populations have been recorded in a specific time period so it is likely that interbreeding events took place there. The first appearance of AMH out of Africa was documented at Skhul cave in the Mount Carmel close to the current Mediteranean sea coast line, and in Qafzeh rock shelter on the Mount of Precipice in the Lower Galilee. Both of sites yielded remains of several individuals associated with Mousterian (Tabun C type) artifacts. In addition, *Nassarius gibbosulus* shells that were probably intentionally perforated were found in Skhul (Vanhaeren et al. 2006). *Glycimeris insubrica* shells with natural holes probably modified by humans (string) were found at Qafzeh rockshelter (Bar-Yosef Mayer et al. 2009). The age estimates for both sites range from 100–130 ka BP (Grün et al. 2005). An AMH calvaria found at Manot cave in Western Galilee has been dated to around 55 ka BP (Hershkovitz et al. 2015). Not far from Skhul Cave, near Mount Carmel, Tabun

A detail of Skhul Cave located behind the left corner of Carmel rock.

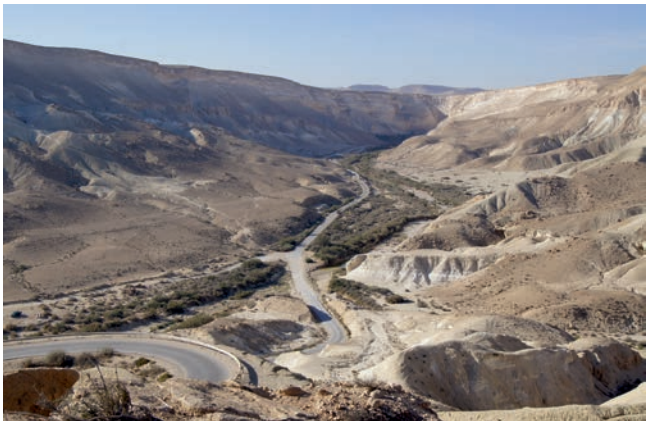


Carmel caves with Tabun Cave portal, Israel.

cave known for its long stratigraphic sequence has yielded Neanderthal skeletal remains from level C. The estimated age is in the same time span as Qafzeh and Skhul (Grün et al. 2005). Slightly younger ages were estimated for other Neanderthal human remains in the region – 48–60 ka BP for Kebara cave located close to Mount Carmel Caves (Valladas et al. 1987) and 50–70 ka BP for Amud Cave in the Lower Galilee (Valladas et al. 1999). Currently available date suggest that both populations – Neanderthals and AMH – although probably employing different subsistence strategies (Lieberman, Shea 1994), were present in the Near East around 130–50 ka BP. This is the time period when the main interbreeding event is expected to have occurred.

Approximately 200km to the south of Mount Carmel in the Negev Desert (and still in the Near East) is another important site relevant to the technological development towards the Upper Paleolithic – Boker Tachtit. The site is located on the right bank of the Nahal Zin river terrace, near the present day township Midreshed Gurion. As human remains were not recovered at this site, the makers of the recovered artifacts are unknown. The site consists of four superimposed layers dated to the time span between 50–40 ka BP. While the three lower layers attributed to the Emiran are characterized by bidirectional production of elongated Levallois points including Emireh points from one core and Upper Paleolithic tool types in typological spectrum (including end scraper and burins), the upper layer shows different technology – production of elongated convergent blanks. Based on this sequence, A. Marks (1983) defined the Middle to Upper Paleolithic transition, i.e. between layers 3 and 4. In addition, the technology of this site was reconstructed in detail using refitting (Volkman 1983) which allows us to compare it with other sites from this period. On the opposite bank of the Nahal Zin is another important site – Boker – an Early Ahmarian site. The Early Ahmarian, fully Upper Paleolithic blade industry with el-Wad points can be seen as a next step in the local technological development and may represent a predecessor of the European Proto-Aurignacian.

The anatomical modernity of early AMH in Africa was supplemented by behavioral modernity that included various behavioral innovations (e.g. McBrearty, Brooks 2000). When tracing only a single attribute of symbolic behavior – personal ornaments made from shells (beads) – the earliest evidence is known from Qafzeh and Skhul in the Near East, and slightly later at many sites in Africa (e.g. Blombos Cave, Border Cave, Oued Djebbana, Grotte des Pigeons; e.g. d'Errico, Stringer 2011; Zilhão 2007). At a slightly later time, but still before 40 ka ^{14}C BP shell beads were found in association with the Initial Upper Paleolithic in Üçağizli Cave in Türkye (Stiner et al. 2013). The earliest European shell beads dating to around 44 ka cal. BP from Líšeň are associated with a specific (Líšeň Podolí I-type) Early Upper Paleolithic industry, while in other parts of Europe shell beads are associated with Proto-Aurignacian and Early Aurignacian industries (Zilhão 2007). At a similar time (i.e. in the period when first AMH penetrated the European continent), the use of shells was documented in a Neanderthal context e.g. Cueva de los Aviones (Zilhão et al. 2010).



Boker Tachtit, Negev Desert, Israel.

We can conclude that even if the trajectory of those finds correlates with the trajectory of AMH advance, more research (including discovery of new sites with new finds, well dated and associated with human fossils) in this field is needed.

Given the lack of skeletal remains in Central Europe where humans occupied open air sites where osteological material was dissolved during pedogenesis, how do we trace the dispersal of the AMH? One possible way is to try and trace attributes of modern behavior and focus on inorganic material that has survived in the archaeological record. This material often includes only rock that was used to make stone tools. We are able to study raw material procurement including raw material networks, technology of production blanks and typology of tools. On rare occasions, shells have also survived in the aggressive soil sediments.

Líšeň/Podolí I. Perforated and colored mullusc shell. Photo L. Zahradníková.