Poster Presentation Number 9, Session 1, Thursday 18:15

Linking blades: a systematic refitting analysis of blade fragments from the Protoaurignacian sequence of Fumane Cave

Armando Falcucci[1], Domenico Giusti[2], Filippo Zangrossi[3,4,5], Matteo De Lorenzi[5], Letizia Ceregatti[5], Marco Peresani[5,6]

1 - Department of Early Prehistory and Quaternary Ecology, University of Tubingen, Schloss Hohentubingen, 72070 Tubingen, Germany · 2 - Paleoanthropology, Senckenberg Centre for Human Evolution and Paleoenvironment, University of Tübingen, Tübingen, Germany · 3 - Department of History and History of Art, University Rovira i Virgili, Avinguda de Catalunya 35, 43002 Tarragona, Spain · 4 - Catalan Institute of Human Paleoecology and Social Evolution (IPHES-CERCA), Zona Educacional 4, Campus Sescelades URV (Building W3), 43007 Tarragona, Spain · 5 - Department of Humanistic Studies, Anthropology and Prehistory, Section of Paleobiology, Corso Ercole I d'Este 32, 44100 Ferrara, Italy · 6 - Institute of Environmental Geology and Geoengineering, National Research Council, Piazza della Scienza 1, 20126 Milano, Italy

High-resolution chronostratigraphic frameworks of the early Upper Paleolithic (eUP) are pivotal to the understanding of the dispersal and adaptation of early modern humans across the European subcontinent. Chrono-cultural models are commonly built through the analysis of the material culture, especially lithic artifacts, recovered from multi-stratified sites. However, despite playing a major role in the formation of lithic assemblages, site formation processes are seldom taken into proper consideration when analyzing cultural dynamics throughout a site's stratigraphic sequence [1]. Unraveling the taphonomic history of a site is rather critical in the study of the eUP – a period characterized by significant sedimentary and post-sedimentary processes correlated to major climatic events. Furthermore, disentangling the history of old, long-lasting site excavations is especially crucial in the analysis of archaeological assemblages. To this end, we conducted an extensive lithic refitting study that involved the systematic test for connections between blade fragments from the whole Protoaurignacian sequence of Fumane Cave [2], spanning from 41 ky cal BP to ca. 37 ky cal BP [3]. This approach is particularly effective for assessing the integrity of lithic assemblages because it allows to make the search for connections more systematic, objective, and statistically quantifiable [4]. Furthermore, the spatial analysis of the refitted fragments allowed us to better evaluate the reliability of the archaeological sequence and to refine our previous conclusions about the Protoaurignacian at the site [5].

Specifically, after devoting approximately 400 hours in the preparation of the assemblages, we isolated ca. 3,200 blade fragments to perform the break connections program. Blade fragments were laid on several tables and divided according to breakage, raw material type, and technological features. Thus, all possible connections were systematically tested by three independent lithic analysts until the relation between costs (i.e., time) and benefits (i.e., number of connections found) drastically decreased. Furthermore, we recorded several attributes on these fragments (e.g., thermal alteration, patina, edge damage) to conduct a lithic taphonomic study.

Overall, we were able to successfully connect ca. 500 blade fragments for a refitting rate of 16%. By statistically quantifying the distance and orientation of the refitting implements, and by assessing the spatial distribution of relevant taphonomic attributes, we were ultimately able to identify a relatively less disturbed area of the excavation, to be sampled for a more robust techno-typological study. Intra-layer conjoins are more frequent in the lowermost part of the sequence, which corresponds to the major occupation event at the site. Nevertheless, inter-layer conjoins are rather common throughout the sequence and would suggest significant post-depositional processes. Remarkably, the technological differences across the analyzed layers appear to be more marked than previously thought. We will therefore propose revised hypotheses and predictions that have a major significance in the study of eUP population dynamics.

Fieldwork and research at Fumane are coordinated by the Ferrara University in the framework of a project supported by the Ministry of Culture, public institutions and private associations and companies. This research is funded by the Deutsche Forschungsgemeinschaft (DFG) under grant agreement no. 431809858 – FA 1707/1-1.

References: [1] Goldberg P., Nash D.T., Petraglia M., 1993. Formation processes in archaeological context. Vol 17. Prehistory Press, Madison. [2] Bartolomei, G., Broglio, A., Cassoli, P.F., Castelletti, L., Cattani, L., Cremaschi, M., Giacobini, G., Malerba, G., Maspero, A., Peresani, M., Sartorelli, A., 1992. La Grotte de Fumane. Un site aurignacien au pied des Alpes. Preistoria Alpina (28), 131-179. [3] Higham, T., Brock, F., Peresani, M., Broglio, A., Wood, R., Douka, K., 2009. Problems with radiocarbon dating the Middle to Upper Palaeolithic transition in Italy. Quaternary Science Reviews 28(13-14),1257-1267. [4] Bordes J.G., 2000. La séquence aurignacienne de Caminade revisitée: l'apport des raccords d'intérêt stratigraphique. Paléo 12, 387-407. [5] Falcucci A., Conard N.J., Peresani M., 2020. Breaking through the Aquitaine frame: A re-evaluation on the significance of regional variants during the Aurignacian as seen from a key record in southern Europe. Journal of Anthropological Sciences 98, 99-140.