

Production system of shaping tools in the late Middle Palaeolithic: the case of the Micoquian workshop from SW Poland

A. Wiśniewski¹, M. Chłóń¹, M. Weiss², W. Migal³, K. Pyżewicz⁴

¹Institute of Archaeology, University of Wrocław, Poland; ²Max Planck Institute for Evolutionary Anthropology, Department of Human Evolution, Leipzig, Germany; ³State Archaeological Museum in Warszawa, Poland; ⁴Institute of Archaeology, University of Adam Mickiewicz, Poznań, Poland

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Shaping tools in Central Europe are well-known from the late Middle Palaeolithic assemblages attributed to Micoquian or Keilmessergruppe/Prądnik cycle. However, the reconstruction of production methods and operational chain concerning shaping tools is hindered due to lack of workshops. The aim of this paper is to present results of the study on remains of the Micoquian workshop Pietraszyn 49a which has been recovered in 2012 in SW Poland. Conducted research comprise morphometric analysis of waste material, refits of tools and their pre-forms, reconstruction of production stages using 3D models, experimental replication as well as microscopic examination of technological traces. This work has been financially supported by Polish National Centre of Science (no project 2017/25/B/HS3/00925).

It was observed that the manufacture was preceded by the selection of flat nodules or chunks of erratic flints. During the tool shaping mineral and organic hammers were used. Approximately 40 bifacial tools were prepared at the site. Although it seems that the manufacture of tools was not governed by rigid rules, several "imperatives" were present. One of the most important steps was the separation of the active part consisting of working edge, sometimes in relation with a tip. Another important working step was the creation or separation of a passive or prehensile part, consisting of a base and a back.

The refitting study of lithics lead us to the conclusion that the production resulted in individualized forms, among which plano-convex specimens predominate. Shaping processes had different dynamics, depending on volume and quality of raw material as well as the specific part of the tool. It seems that the shaping of the flat side of the tools costed less effort and time than the shaping of the convex sides of tools. During the reduction phase, humans produced many flakes and sometimes blades. They have sporadically been used as blanks for expedient tools. It is worth mentioning that the site hasn't provided any traces

of core reduction. It seems that the production of bifacial tools could have been a part of logistic systems of hominins related to hunting strategies and food extraction.