

”Replacement of Neanderthals by Modern Humans” archaeological database and its potential for interdisciplinary research

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Research Team A01 ”Archaeological Research of the Learning Behaviors of the Neanderthals and Early Modern Humans”, directed by Yoshihiro Nishiaki, is part of the multidisciplinary project of ”Replacement of Neanderthals by Modern Humans” (<http://www.koutaigeki.org/>), and is collecting the information on paleoanthropological sites and lithic industries in Africa and Eurasia between 200 k.a. and 20 k.a. towards a better understanding of the progression of the replacement of Neanderthals by anatomically modern humans. By February 15, 2012, we have recorded 1,264 sites, 3,177 cultural layers, and 4,896 radiometric samples to our client-server relational database system named *Neander DB*, which is featured by updates of recently discovered sites in Africa, Arabian Peninsula, Central Asia, and Siberia, as well as integration of the European databases published by the preceding projects.

The data gathering process described above targets so extensive regions that it has revealed some important issues that regional archaeologists have conventionally overlooked. Firstly, lithic industries sometimes have different regional terminology. For instance, Mousterian was originally defined in Europe and is thought to belong to Neanderthals, while the similar industry is called ”Nubian Complex” in Eastern Africa and Eastern Arabian Peninsula. Secondly, the concept of cultural layers was originally developed under the assumption that paleoanthropological sites were likely to be located in caves and shelters in which anthropogenic deposits were usually layered, while it is difficult to apply the same concept to open sites in Siberia and other regions. Thirdly, it has also been revealed that different fields of research may apply different time scales, which could be a problem when comparing archaeological time periods with the paleoclimatic proxies that Research Team B02 is developing.

In order to give a solution to these issues, we flexibly changes the specification and structure of *Neander DB* on demand. For example, a table of correspondence was inserted to explicitly define the relationship between lithic industries and time periods. Our network-based database works well without any troubles in versioning because we are editing the single master database.

The information of paleoanthropological sites recorded in *Neander DB* will be an infrastructure to carry out interdisciplinary research in the ”Replacement of Neanderthals by Modern Humans” project. In particular, it is expected that a GIS-based integration of radiometric dates, paleoclimate, and paleogeomorphological information may contribute to visualizing the spatio-temporal correlation between human evolution and climate change. We would like to have an active interaction with geoscientists attending the session with regard to the information sharing and integrated analyses.

Keywords: Replacement of Neanderthals by Modern Humans, archaeology, site, database, data mining, interdisciplinary research