

Subsistence strategies and their transformations in the Late and Final Neolithic of East-Central Europe

The main goal of this project is to understand the subsistence strategies of the archaeological societies known as the early Corded Ware culture (CWC). Their appearance between about 2,900 and 2,750 BC is now believed to be the result of the migration of large groups of people from the Black Sea steppes. Such a large influx of people probably was how the first Indo-Europeans spread westward, bringing with them language and a range of socio-economic innovations. A relatively quick replacement of permanent settlements with scattered camps took place at that time in East-Central Europe. This is interpreted as a shift from an economy based on the cultivation of plants and animal husbandry towards semi-sedentary pastoralism. The true nature of these changes, however, remains hidden, as highly mobile societies leave behind few archaeological traces. Usually these are graves and loose pottery fragments and flint tools, with no evidence of house foundations. Moreover, the emergence of CWC communities was preceded by the migration of groups of people associated with the Baden culture across the Carpathians. They brought with them a number of social and economic novelties that originated in the Near East. Currently, we do not fully understand the evolution of the societies of East-Central Europe during these two migrations that occurred during the transition from the Late to the Final Neolithic periods. Moreover, the role of other cultural and environmental factors in this process, especially climate change, remains unclear. We plan to fill this knowledge gap by applying novel biomolecular methods in conjunction with accumulated archaeological evidence and current anthropological knowledge.

Analyses of fat residues trapped in ceramics, recently carried out in Poland and north-eastern Germany, show that the percentage of vessels used for milk processing increased between the Early and Late Neolithic periods. Moreover, the values of carbon isotopes measured in animal fats and bones suggest that the gradual transition to semi-sedentary husbandry took place even before the advent of CWC societies. Unfortunately, almost no animal bones has survived at CWC archaeological sites. The few human skeletons from this period we examined also show profound changes in the economy, mainly that they raised herds in deforested areas. The limitations resulting from the scarcity of bone at settlements and in graves can now be overcome by using innovative biomolecular methods to characterize animal and plant products processed in pottery.

The first novel method we propose is based on high-resolution mass spectrometry and allows the identification of traces of cereal plants in pottery. The second innovative method allows the reconstruction of the local climate based on the values of hydrogen isotopes in animal fats trapped in pottery. Analyses of carbon isotopes from these animal fats will provide information about their diet and the landscape in which they grazed and will also show whether the pottery was used to prepare aquatic foods. To gain a better insight into the economy and diet of CWC societies, we will also analyse proteins extracted from the pottery. This third innovative method will allow us to determine which species were bred and eaten, even if their bones have not survived at the same archaeological site. Since pottery fragments are present at most CWC archaeological sites and animal and plant fats trapped in sherds are extremely resistant to degradation, they can also be used for radiocarbon dating to determine their absolute age. We will use this final innovative method to track both changes in subsistence strategies and changing climatic and environmental conditions that may be associated with the appearance of CWC communities in East-Central Europe.