

The submitted research project is aimed at the complex analysis of bronze-working practices and strategies adopted by the Late Bronze Age and the Early Iron Age communities inhabiting the area within the historical boundaries of Greater Poland.

In the history of civilisation, mastering metalworking skills occupies a very special and important place. The development of metallurgy and foundry stimulates significant socioeconomic, technological and scientific changes. In prehistory, metals and alloys were used by humans for the manufacturing of utilitarian or symbolic objects: weapons, implements, or ornaments. Metal artefacts were the manifestations of wealth and prestige of the owner, and they showed the artistry and technical knowledge of the manufacturer. The development of metallurgical centres in the areas rich in deposits of metal ores, in combination with a large demand for bronze items, contributed to the development of trade and cultural contacts even between distant communities. This led to a considerable cultural unification of Europe during the Bronze Age.

The Late Bronze Age and the Early Iron Age (13th–7th cent. BC) in Greater Poland are the richest periods in terms of sources for the study of bronze-working. In the Polish lands, it falls on the time of development of the so called Lusatian culture, named so after the discoveries made in the second half of the 19th cent. in the area of the present-day Lusatia.

The analysis of metal artefacts, particularly the remains of technological processes including casting moulds and crucibles, requires the knowledge of manufacturing practices and the nature of material both in the solid and in the liquid state. The comprehensive evaluation of the manufacturing is only possible after a number of investigations in the field of material science and technology with the use of specialist equipment.

The complex issues of the past technology require the combination of specialist knowledge in terms of archaeology, metal science, materials engineering, casting technology, geology, and analytical methods including optical microscopy and scanning electron microscopy, spectrometry, X-ray imaging, as well as 3D visualisations, and computer simulations. Therefore, the research programme will be carried out by a dedicated team including specialists of the abovementioned disciplines.

Due to the varied character of the material from archaeological sites, including not only metal artefacts but also slag, crucibles, clay and stone moulds, and the remains of castings, it is important not only to organise a suitable research team but also to select appropriate observational-measurement equipment, and gain access to a technological laboratory, specialist software and databases.

The representatives of science team must be aware of the cultural value of the material under study and the necessity of using appropriate, often unconventional methods of research, including mostly non-destructive or micro-destructive methods, the proper way of preparation of the material and interpretation of the results which differs from the results of the study of modern material.

The methods have been selected with regard to the kind of material. The analysis will be based on: optical microscopy (OM), scanning electron microscopy (SEM) with the energy dispersive X-ray Spectroscopy (EDS), X-ray fluorescence (XRF), as well as digital X-ray imaging, and microhardness testing.

At the same time, samples from important archaeological contexts associated with bronze-working and from the so called graves of metallurgists will be collected for radiocarbon dating (AMS, LSC). The osteological material from those contexts will undergo anthropological analyses complemented with isotope measurements (strontium isotopes). The results may be used for determining the place of origin of the buried individuals and verifying the concept of a migratory character of this craft. In the case of stone artefacts, the petrographic analysis is planned.

The results of investigations carried out within the frameworks of the project will have a great significance for the issues related to the exchange of ideas, knowledge and commodities, the process of developing of elites and social structures, the emerging of professions, and the innovativeness of prehistoric craftsmen. The results of the research project will enable the future studies on changes which were taking place in the discussed area during the Bronze Age, from its beginnings to the appearance of a new metal resource, iron.