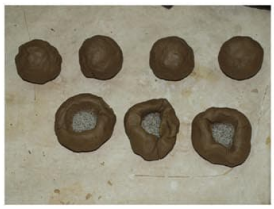
EXPERIMENTAL **POTTERY** PRODUCTION

In the period between 2013 and 2016, a series of lectures and experiments was carried out within a programme called *Through experimental archaeology to the technology of pottery production in prehistory*. They were targeted towards the students of the Department of Archaeology in Zagreb, and devised by the Centre for Experimental Archaeology, Department of Archaeology in Zagreb at the Faculty of Humanities and Social Sciences, and Institute of Archaeology in Zagreb. The aim of the programme was to transfer the basic theoretical and practical knowledge regarding the methods of pottery production.The lectures and experiments comprised the whole procedure of pottery production – from the acquisition of raw material to the methods of firing. This poster presents some of the results of the experiments, with the emphasis on reduction firing process.





In reduction firing process, the oxygen supply to the firing pit is restricted, resulting in saturation of free carbon in the atmosphere, which makes the pottery black in colour. The aim of the experiment is to gain experience, to record the firing procedure in detail, to achieve reduction atmosphere in the firing pit, to fire the pottery, and to determine its physical properties.The emphasis is put on better understanding of the firing process and of the properties recorded on fresh fractures of pottery samples, which should increase the quality of archaeological interpretation.

The firing pit measured 70 cm in depth, and 60 cm in diameter. On the South-Western side of the pit a shallow canal was dug, which was used for the installation of the pyrometer probe. The bottom of the pit was covered with ceramic waste (tiles) for isolation purposes.The following materials were placed on top of the tiles (from the bottom to the top): dry grass, dry branches gathered previously from the forest, dry grass, and sawdust. On thus arranged fuel, ceramic tablets and vessels were placed in two stories, which were then covered with sawdust, dry cow dung, dry grass, and dry branches. The pyrometer probe was placed so that the temperature was measured between the clay tiles and the vessels. The pottery firing lasted for 320 minutes, and the temperature was taken every 10-15 minutes. During the firing process, the fuel was added continuously. Due to rain, the firing was terminated two times, and was abandoned altogether after five hours. The pottery remained in the pit until the next day.







RESULTS

- In the first stage of the firing, the temperature rose rapidly. The highest temperature achieved measured between 600°C and 640°C, and was maintained for about 30 minutes.
- The samples were not fired completely because the firing was terminated due to rain. It is assumed that two more hours of firing would be sufficient for the completion of the process.
- Depending on the position of the pyrometer probe, the temperature in the pit sometimes varied over 100°C.
- 14.3 % of the fired samples are damaged in the shape of spalls, which is a consequence of the rapid rise in temperature in the first stage of firing, i.e. of the rapid release of water from the clay.
- Dark-gray colour (66.6 %) of the outer surface of the samples indicates that the reduction atmosphere of the firing was achieved. However, the core colour of the majority of samples is brown (76.2 %), which indicates that the reduction process was incomplete and that the clay was not completely fired. Gray and sometimes ochre colour of the outer surface of some samples is a consequence of penetration of air during the firing.
- Gray and dark-gray colour of the core of some samples is a consequence of the presence of organic materials (dry grass and dung) in the clay admixture, which markedly affects the core colour.

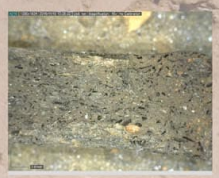




Chart 1. Firing regime (the red line represents the time during which the temperature was not taken and the fuel was not added due to rain).

CONCLUSION

The results of the experiment have shown that the pit firing lasts, in average, five to seven hours, and that the position of fuel and the fired material can be one of the factors which affect the end result of the firing. The composition of clay paste also markedly affects the colour of the core, which is of great importance for archaeological interpretation. The reconstruction of the firing process is a complex procedure, which depends upon a great number of factors, and the replication of the experiment is an important step to the better understanding of those factors.

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