

## Final Report

on

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The outstanding locality of the European cultural history, Mosaburg/Zalavár was the seat of the easternmost province of the Carolingian Empire, one of the centres of Christianisation of the Carpathian Basin before the Hungarian conquest, in the 870s seat of the Pannonian Archbishopric, at the end of the 9th century the Pannonian residence of the emperor Arnulf. County seat in the 11–13th century, where one of the oldest Benedictine Monastery was founded (1019). The monastery became locus credibile from the 13th c. on, and served as a border fortress in the 16-17th c. against the Ottomans and finally, in 1702 it was demolished.

By the excavations from 1948 onwards an enormous amount of archaeological finds were brought to light. The settlement of this material and documentation related to it, with the processing of the results started successfully on former applications, the first book like manuscripts were born. The aim of this application is a continuation and consummation of these antecedents: recording, drawing, photo-taking of the circa half million ceramic finds, proceeding to analyse the archaeobotanical, archaeozoological, anthropological, archaeogenetical, dendrochronological samples and to execute other specific scientific investigations (physical and chemical analyses of noble metal, ceramics, glass finds). As a result of these activities new catalogues will be compiled, processing of particular finds will be prepared and by means of them scientific results will be available for the professionals.

One of the most important aims of the application was to create a manuscript on a graveyard in which churchyard cemeteries of the Holy Virgin (founded in 850, refounded in 1019) of the Martyr Hadrian (founded around 855) were interlocked, containing more than 2000 graves from the 9th century up to the end of 11th century. The elaborated and standardized description of the graves and finds were completed, together with analytic drawings, photos, graphics and the digitized map of the multilayer cemetery. Series of physical, chemical and comparative analyses were made on the finds.

In 2012 the data recording and redrawing of the graves of the cemetery excavated in 1952–1992 were completed (cca 700 burials); the grave finds of this area were restored (partly newly restored). In 2013 the finds were described in detail, and the finds excavated after 1994, were inventoried (380 items, 920 objects). In 2014 the catalogue of the graves were completed (near 1100 pages – 2.9 million characters) supplemented by the descriptions and the drawings of the restored finds arranged in 150 plates.

The anthropological analysis of the graves of the Hadrian's churchyard was finished under the duration of the application: metrical, age and generic data were defined and also the pathological alterations were described. In 2016 this traditional anthropological analysis was completed by radiocarbon investigation. The absolute dating of the Carolingian period on the basis of samples found in Hungary is a unique research project. The graves excavated in and

around the Hadrian's church give definitely authentic samples. Prior simulations made by the OxCal software showed that a series of circa 35 individual data gives a very precise dating of the investigated period. The chronological model was set up by combining the measuring results of the Glasgow (SUERC) and the Oxford (RLAHA/ORAU) labs. 20 samples were chosen (840 AC – 11th c. AC) and they were sent for dating to the Scottish Universities Environmental Research Centre, within the frames of this application. The dating of a series of samples defined in a lab can be specified by statistical methods, but the Glasgow data will be completed by the results of the Oxford lab (realized by another project). The combined evaluation of these two series on the basis of the Bayesian statistical method will result a better founded, very precise chronological model.

Modern processing certain settlement phenomena and ceramics of the excavations 1948–1994 at Zalavár-Vársziget was another important task of the application: In 2012 K. Gergely compiled an elaborated catalogue of the unpublished (or partly published) ceramic finds excavated by G. Fehér until 1954 in the southern part of Zalavár-Vársziget. This catalogue was completed with the finds of the excavations in the 1960s, 1970s and 1980s led by Á. Cs. Sós both on the southern and on the northern part of the Vársziget. 5500 fragments of ceramics were described and typologized. The results of this processing combined with the dendrochronological data certified a former hypothesis, that the ramparts of the Vársziget were erected at the end of the 9th century, in the age of the Hungarian conquest, and do not belong to the legacy of the Arpadian Age (11–13th century).

The processing of the details of cemeteries and settlements was significantly helped by the digitalization of the written, graphic and photo documents on Zalavár in 2012, kept in the Central Database of the Hungarian National Museum. The digitalized Zalavár database consists of 335 items. It was a 'bonus' – originally not included in the program. Another 'extra' investigation made by Á. Ritoók resulted data of the effective activity area of the locus credible of the Zalavár monastery, together with the medieval road network and -hierarchy, vegetation and agriculture. By 2015, the preparatory works of the publication of the remains of the 11–13th c. secular centre ('Colon civitas') significantly progressed, though the results of the excavations in the last two years modified the interpretation of some phenomena.

In 2013 the senior researcher of this program defended his DSc dissertation 'Pannonia in the Carolingian Period'. The presented results were based on the Zalavár excavations and the processing's supported by OTKA.

From 2012 on the primary registration of the finds excavated around 2000 is going on (11,851 pcs of fragments in 2012 and from 26 settlement features 12,486 pcs in 2013.) In 2012 105 plates were drawn. Special types of pottery were inventoried and drawn (260 pcs) together with the polished ware and the pottery with bottom stamps (341 pcs). Small finds of the settlement (iron, antler, clay) were also inventoried (520 pcs).

In 2014 a dozen of complete and more than 4000 fragments of polished ware were catalogued in an excel table, completed by 130 artistic graphic plates and photos of every piece. The inventorying of the special types of pottery and the bottom stamps were finished, the catalogue, drawings and photos of them are ready. The primary registration of the finds also

continued (13,000 pcs in 80 boxes). In 2015 primary inventory number was written on 12,500 finds (74 boxes). The reconstructed vessels were drawn and photographed.

The documentation (photos, drawings, catalogue) of the glass finds found in the glass workshop served during the building of the Hadrian's church and its surroundings also was completed in this year (658 window panes, 123 fragments of glass vessels, 400 fragments of crucibles and raw glasses).

The most valuable finds of outstanding quality are exhibited on the permanent exhibition of the Hungarian National Museum (chief curator Á. Ritoók). The guide book of the 9th century part of the exhibition has a Hungarian and an English version, its extent is 140 pages (A Karoling kor a Kárpát-medencében/The Carolingian age in the Carpathian-Basin). A smaller guide (Hungarian/English, German, Italian, Russian) belongs also to the exhibition, the authors are the senior researcher and László Révész.

In 2013 a palace was excavated in Zalavár-Vársziget. It was built certainly for Arnulf, king and emperor in the 880s in Mosaburg. Fragments of blue glass with gold paintings found in the ruins prove that it was royal residence.

Participants of the project studied the newest archaeological and historical literature in Germany and in Austria. The results of the Zalavár research project were presented in foreign exhibitions (Brno, Bratislava) and on international conferences (München, Mainz, Freiburg, Mistelbach/Nieder Österreich, Ruma/Serbia, Wien, Budapest).