INDUSTRIAL ARCHAEOLOGY AND ARCHAEOMETRY NEWS

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INTRODUCTION

As we have mentioned in the EDITORIAL, the aim of our English summary is to let our foreign colleagues know the activity of the Industrial Archaeology and Archaeometry Working Groups working within the frame of the History Committee of the Veszprém Academic Committee, and to inform them about the contents of the present copy of the Industrial Archaeology and Archaeometry News.

About the organization and the aims of the Industrial Archaeology Working Group

The first Industrial Archaeology Conference in Hungary was organized in 1980. Its topic was the archaeological and scientific approaching to the kilns and furnaces discovered in the country. The setting up of an Industrial Archaeology Working Group was decided by the Conference with the aim of compiling the register of the Hungarian industrial kiln and furnace remains, workshops together with raw materials, tools, artefacts and by-products found in or near them, indicating the archaeological data and results of the scientific investigations.

The working group aimed also at making contacts with scientists who can help the archaeologists in the instrumental prospecting, dating and examination of materials.

The chairman of the working group is historian Dr. Gusztáv HECKENAST and the secretary is archaeologist dr. János GÖMÖRI.

Since 1982 the working group has informed the experts in the Industrial Archaeology News about its activity, about excavations discovering industrial archaeological objects in the country, the special literature etc.

About the organization and aims of the Archaeometry Working Group

The second Industrial Archaeology Conference was already organized by the Industrial Archaeology Working Group in 1982. As there was not any scientific institute dealing only with the investigation of museum objects in Hungary, the participants of the Conference proposed to the Veszprém Academic Committee to set up an Archaeometry Working Group for the coordination and support of these kinds of works.

The new working group began its activity with the compiling of the list of specialists dealing with archaeometry /in part time/ in different research institutes and industrial laboratories in Hungary. One of the main aims of the working group is to ensure possibilities for these scientists -by organizing meetings and publishing together with the Industrial Archaeology Working Group the Industrial Archaeology and Archaeometry News- for the exchange of experience in archaeometric research. The working group gives information about investigation methods for archaeologists, organizes common research programs.

The chairman of the working group is chemist Prof.Dr. Miklós BAKOS, the secretaries are chemist Márta JÁRÓ and archaeologist-chemist dr. László KÖLTŐ.

In the following we publish those pieces of news and abstracts of articles of the present copy of the newsletter /in its thematic order/ which can be interesting for our foreign readers and we hope to have their remarks.

ARCHAEOMETRY WORKING GROUP NEWS

● The Archaeometry Working Group organized its latest meeting in May, dealing with material investigations.

You can find here the summaries of the delivered lectures.

ZIMMER, Károly: Spectrochemical investigation of pieces of glass from the immigration period and from the Middle Ages

The glass base material of the necklace fragments from the 3rd-4th centuries, found in a cemetery excavation in Budapest was identified by X-ray diffraction. The concentration of the main components was determined by thermometric analysis and the colouring materials by optical emission spectroscopy using DC arc excitation. The correlation of the colour groups and the characteristic element content was determined by multidimensional variance and discriminance analysis.

Glass fragments from the Middle Ages, excavated in the Buda Castle were examined by thermometric analysis and X-ray fluorescence spectrometry.

The determination of the concentration of impurities, accompanying and colouring elements was undertaken by different spectrochemical methods. DC arc and glow discharge excitations were used for the powdwer samples, ICP excitation for the dissolved samples.

The element distribution was measured by electron probe microanalyser.

The classification of 69 pieces of glass was accomplished by pattern recognition and multivariable variance and discriminance analysis. The earlier archaeological assumptions were corrected in 12 cases, and new classifications were stated concerning the origin of the pieces in 32 cases.

BEZECZKY, Tamás: Archaeometric investigation of Roman amphoras from Pannonia

With the determination of the origin of the amphoras we can get information about the trade of important food wares, because the place of their production is usually the same as the place of making the storing amphoras.

In the frame of the present research program there were amphoras investigated, excavated near the ancient trade routes which connected Pannonia with Italy. Not only traditional archaeological methods but also modern scientific procedures were used.

The minerals used for the tempering of the clay were examined by petrographic methods, the composition of the basic material was determined by X-ray diffraction, and the trace elements were identified by neutron activation analysis.

PAPP, János: Chemical investigation of the metal fittings of a Roman wooden casket /4th century A.D./, excavated in Aquincum

Data obtained by chemical analysis showed that the fittings contain higher zinc and tin amounts /10,5% and 6,5%/ than the characteristic Roman alloys. It is presumable that a local master made it who didn't know the rates usually used for alloys, or he didn't use Roman import metal. Maybe the metal was gained by melting of other objects.

PAPP, János: The problems arose during the chemical investigations of the silver objects from the sepulchral chapel in Üröm

József, the palatine of Hungary had the sepulchral chapel and crypt of his wife, Alexandra Pavlovna /the daughter of the Russian tzar/ built in 1802.

On the contrary with the silver objects and silver embroideries in the chapel, the silver threads are glittering metally on the silverbrocade costume of the Grand Duchess lying mummified in her coffin. The resistance to corrosion of the nearly pure silver is due presumably to the crystal structure of the metal.

The relatively big quantity of bromine determined on the threads indicates perhaps, that Alexandra was poisoned.

TIMÁR-BALÁZSY, Ágnes: The investigation of the dyestuffs of the Hungarian coronation mantle

The investigation of the dyestuffs of the gold embroidery coronation mantle from the 11th century was carried out parallel by the lecturer and Wilma ROELOFS, researcher in the Centraal Laboratorium in Amsterdam with thin layer chromatographic method.

The aim of the examinations was to reconstruct the original colour sheme of the art object and to answer some unsolved cultural historical questions.

On the warp of the embroidered 11th century Byzantine samite fabric weld /Reseda luteola/, madder /Rubia tinctorum/ on the purple weft, indigo on the green weft was found, and an unidentified yellow was present. On this basis one can suspect a more yellowish original colour than the one today.

The definition of the today khaki embroidered parts was of crucial importance. Having found weld to be present, the result of the analysis did not contradict the art historians' assumption that this thread may have been green.

The dyestuffs of the silk support fabrics and the fixing threads were also analysed.

The dyestuff analysis of the 11 mending patches helped the art historians in the separation of the patches of different origin.

BAUMANN, Miklós: Electronmicroscopic examination of the paints of Raphael's paintings "Esterházy Madonna" and "Portrait of a young man"

The two Raphael's paintings stolen from the Museum of Fine Arts in Budapest, and later found, were undertaken to technical examination before restoration.

20 paint samples were analysed by scanning electronmicroscope and the connected energy-disperse X-ray analyser. It was determined that the master used lead-white, gypsum and green earth for the grounding.

The identified pigments are: lead-white, gypsum, green earth, malachite, yellow ochre, ochre, red lead, azurite. The presence of ultramarine couldn't be proved.

● With the title:"The limits of archaeometry.The secret of the Turin shroud" the editor of the newsletter summarises the results concerning the scientific investigations of the strange relics, in connection with the fact that the book dealing with the shroud, published in December 1984 turned out to be a best seller in the Hungarian bookmarket. /László VIZ: A torinoi halotti lepel /The Turin shroud/, Ecclesia, Budapest, 1984, pp. 192/

● A brief survay joins to the topic about what kind of instrumental analytical methods were used for art object investigations worldwide till the beginnings of the eighties.

● One of the aims of the Archaeometry Working Group is comparing the different investigation methods. Now we publish the brief summary of the article dealing with this problem.

T.BIRÓ, Katalin: Potentials of different material testing techniques and correlation of their results in the study of chipped stone raw materials

In course of the characterization studies performed in the Hungarian Geological Institute, different chemical, physical and mineralogical raw material testing techniques were used. The subject of these analyses were obsidian and silica rock samples of different genetics, used for the production of stone tools in prehistory.

A special attention was paid to the precision, accurace, reproductibility of the methods applied, the scattering of the results and the comparison of the information obtained by the different methods.

It was found that though the exact numerical values might be considerably different /even exceeding the value usable for discrimination!/, the observed tendencies within the series were always identical. This encourages the researchers to use inner etalons /control samples/, instead of numerical values only.

INDUSTRIAL ARCHAEOLOGY WORKING GROUP NEWS

● The Industrial Archaeology Working Group set the task of the archaeological and archaeometric investigation of the brandwalls which belonged to early Hungarian castles. The inner core of the fortification construction made of clay is totally burnt. The question is whether the burning out was intended, and if it was, something else? The archaeologists appealed to the scientists in the latest number of the Industrial Archaeology and Archaeometry News to help them solve the problem. The investigation started in three laboratories after the appeal. In the present copy of the newsletter further researchers are asked to join the work.

The two working groups are going to organize a common conference about the results in November in Sopron, where the most intact brandwall was excavated.

● The newsletter publishes the notes of Dr. Gábor VASTAGH about the so called vitrified fortresses which differ from the brandwalls because they were built of stone and not of clay. In case of these fortifications it is not decided either, why they were burnt in some places, melted and stiffed their outer layer glass-likely. According to assumptions there were some cultic reasons of the burning.

● The secretary of the working group edited the second volume of the Industrial Archaeology containing the contributions of the second Industrial Archaeology Conference organized in 1982:

Iparrégészet II /Industrial archaeology II/ edited by GÖMÖRI, J., published by MTA Veszprémi Akadémiai Bizottság, Történelmi Szakbizottság, Veszprém, 1984, pp. 312, in Hungarian with English summaries

Now we give the contents of the book:

MINING

BACSKAI, E;: Prehistoric mines in the Transdanubian Central Mountains
T. BIRÓ, K.: Obsidian characterization by electron microprobe analysis
TORMA, I.: Roman quarry near the village Budakalász
IVANCSICS, J.: Where were the quarries of Scarbantia? /Investigation of Roman stone material from the excavation of the forum in the present Sopron/
KOREK, J.: The Pomáz quarry from the Árpád period
HEGYI, I.: The beginnings of mining in Hungary in the Middle Ages. The period of mining non-ferrous metals

UZSOKI, A.: Methods of gold washing and extraction

POTTERY KILNS - LIME KILNS - BRICK AND TILE KILNS - IRON AND NON-FERROUS METAL WORKS

JEREM, E.: Celtic pottery kilns in Sopron
KARDOS, J.-KRISTON, L.: Investigation of the material of a Celtic pottery kiln from Sopron-Krautacker Dülő by X-ray diffraction
GÖMÖRI, J.: Potter's settlement in Scarbantia and the Roman brick kilns nearby
BENKŐ, L.: TL dating of an iron smelting furnace found in the Roman cemetery of Scarbantia
HOLLÓ L.-VERŐ, J.: Geophysical measurements at the iron smelting furnaces in Magyarfalva-Kányaszurdok
VÖRÖS, G.: Late Sarmatic pottery kiln in Sándorfalva-Eperjes
LŐRINCZY, G.: Árpád period brick kilns from Tiszalök-Kövestelek
M. ALBEKER, M.: 18th century lime kilns in Pilisszántó
HECKENAST, G.: Some remarks concerning the earliest pig-iron blast furnaces in Hungary
PATEK, E.: The earliest iron articles in Hungary and their archaeological entourage
KÁLDOR M.-TRANTA, F.: Metallurgical study of iron objects found in Mezőcsát. Pre-Scythian period cemetery /8th century BC/
BÁNKI, Zs.: Ruins of an iron smelting furnace in Gorsium?
KISHÁZI, P.: Mineralogical examination of some ancient iron slags from Hungary
KOZÁK, K.: Árpád period workshops and a medieval heating oven in Eger castle
MAGYAR, K.: Sources and relics of medieval ironworking in country Somogy /Part 1/
GÖMÖRI, J.-WALLNER, Á.: Geophysical measurements at the excavation of the Árpád period iron smelting furnaces in Szakony
MÁRTON, P.: The magneting age of the Szakony medieval bloomery furnaces
GÖMÖRI, J.: A medieval lime kiln in Sopron

INTERDISCIPLINARY RESEARCHES IN ARCHAEOLOGY

BENKŐ, L.: TL dating of potteries, furnaces and kilns
KÖLTŐ, L.-KIS VARGA, M.: New results in the archaeological application of X-ray emission analysis
GEGUS, E.-INCZÉDY, J.-BORSZÉKI, J.-BAKOS,M.
ÓVÁRI, F.: Comparative investigation of archaeological findings on the base of chemical composition determination carried out by laser micro spectral analysis
JÁRÓ, M.: Possibilities of spectrochemical investigations of Roman wall paintings

For ordering the volume please contact
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BOOK REVIEWS

There can be found in the literature review summaries of foreign and Hungarian publications, and we publish the annotated bibliography of the books recently acquired by the library of the National Centre of Museums in Hungary, dealing with archaeometry.

Here we give information about two Hungarian publications which can be interesting for our readers abroad.

FÜLÖP, J.: Az ásványi nyersanyagok története Magyarországon /The history of the mineral raw materials in Hungary/, Müszaki Kiadó-Magyar Állami Földtani Intézet, Budapest, 1984, pp. 180, in Hungarian

The author gives details on the relation between the history of the Hungarian mining and the geological situation of the country.

In the first part /dealing with the period from the beginnings to the end of the middle ages/ there are conclusions drawn mainly from the excavated objects and remains of mines. The second part introduces to the time from the end of the 18th century to these days, which was the intensive period of the utilisation of the Hungarian raw material quarries.

Maps and figures illustrate the most important events and data.

Proceedings of the 4th International Restorer Seminar, edited by TIMÁR-BALÁZSY, Ágnes, published by the National Centre of Museums, Budapest, 1984, 1st volume: pp. 274, 2nd volume: pp. 357, in English, French, German

There are 9 articles dealing with archaeometric topics in the volume, and some of the papers give detailed description of material investigations preceding the restoration of art objects.

MEETINGS
CONFERENCES

From among the numerous industrial archaeological and archaeometric conferences we stressed the importance of those which were organized abroad with the participation of Hungarian experts, or which were or will be organized in Hungary.

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