INDUSTRIAL ARCHAEOLOGY AND ARCHAEOMETRY NEWSLETTER

EDITORIAL

10TH ANNIVERSARY OF THE INDUSTRIAL ARCHAEOLOGY AND ARCHAEOMETRY NEWSLETTER

The first issue of our Newsletter was published in 1982, following the first conference on Industrial Archaeology in Sopron. Its primary aim was to get 'archaeologists and scientists informed on each others' activity' in a more regular form. The intersection of several branches of science and arts and the birth of new branches is a natural process typical of our age. Industrial archaeology, archaeometallurgy, archaeometry and environmental archaeology are all products of this process. On the whole, of this branches are supported from the roots of traditional archaeology, and the development of the new branches contribute to the development of the crown of the whole plant. Not even the most developed methods of technical sciences are suitable to substitute traditional aspects of archaeology. A living and continuous connection to the roots, however can carry fresh nutrients to each other.

In this spirit I want to greet the Xth volume of Industrial Archaeology and Archaeometry Newsletter.

János Gömöri

Chairman of the Industrial Archaeology Working Group

NEWS OF THE ARCHEOMETRY WORKING GROUP

The annual meeting of the AWG was consecrated in 1992 to computer assisted archaeology. The meeting took place on 14th of April 1992, at the Institute of Archaeology of the Hungarian Academy of Sciences. The idea of regular meetings on computer archaeology emerged here, also supported by experiences of the CAA (Computer Application in Archaeology) series initiated in Great Britain.

Program of the meeting:

Redő, Ferenc - Muzsik, Gyula: Frequency analyses in numismatic studies

Gyulai, Ferenc: Computer evaluation technique for archaeobotanical finds

T. Biró, Katalin: The Lithotheca database

Puszta, Sándor - Székely, Balázs: Micro magnetic geophysical measurements on archaeological sites

Suhajda, Attila: Application of seriation algorithm on archaeological material of cemeteries

Barlay, Katalin - Kutzián, Ida: Numerical evaluation of the orientation of graves in Neolithic cemeteries

Jerem, Erzsébet - Csáki, György - Somogyi, Péter - Zábó, Péter: Stratigraphical study of settlement units by 3D modelling

Csáki, György - Jerem, Erzsébet - Redő, Ferenc - Zábó, Péter: Presentation on computer applications of archaeological geodesy

NEWS OF THE INDUSTRIAL ARCHAEOLOGY WORKING GROUP

FINAL REPORT ON THE PROJECT 'SITE REGISTER OF INDUSTRIAL ARCHAEOLOGY'

OTKA I/1, Nr. 137

By the support of the OTKA (National Scientific Grant Foundation), a major project on registering monuments of Industrial Archaeology has been accomplished. In the Hungarian edition of our Newsletter, a detailed participant list is published, as well as the chronicle of the work performed each year. The first phase of the project started in 1986 and lasted till 1991. Currently the work is continued on the extension of the project. The scope of the project embraces monuments of industrial archaeology from prehistory till historical times (18th, sometimes 19th century) in a nation-wide relevance. Most of the work accomplished regards the collection of data from archives, publications, inventory books and archaeological excavations. Computer registration of the data has been started but not finished yet.

János Gömöri

NEW FINDS

A medieval smelting plant was excavated at Potzmann dűlő near Sopron in course of rescue excavations. So far, two ore-burning pits were recovered with clay pipes and burnt iron ore pieces. Large pieces of slag indicate smelting with suitable heat relations. The smelting workshop was planted on the yards of a former Roman villa. The excavations were lead by J. Gömöri (Sopron Museum), clay objects analysed for archaeomagnetic dating by P.

Márton. Charcoal samples were found and transported for C-14 dating to E. Hertelendi, Debrecen Nuclear Research Institute (ATOMKI).

János Gömöri

ERLÄUTERUNGEN ZUR LANGOBARDENWERKSTATT

Eisenerzeugung im Rennofen

Seit 1980 wird in Zethlingen eine Eisenverhüttungstelle aus dem 3. Jh. ergraben. Die Öfen gehören zum Typ des freistehenden Windofens mit eingetiefter Schlackegrube, die durch einen Herdgrubenkanal mit der vorgelagerten Arbeitsgrube verbunden var.
Geimensam mit Metallurgen der Bergakademie Freiberg wurden Rekonstruktionsversuche zur Erzeugung von Eisen nach dem im freien Germanien während des 3. Jh. üblichen Rennverfahren vorbereitet. Auch die Erzeugung von Holzkohle lief als Rekonstruktionsversuch im Grubenmeiler. In vier Versuchsschmelzen, die mehrere Tage andauerten, kamen 124/87/83/75 kg Holzkohle und 104/31/40/37 kg Raseneisenerz zum Einsatz. Der Rennofen war nach Interpretation der Grabungsbefunde rekonstruiert worden.
Durch Variation des Ofenaufbaus und der angewandten Technologie konnte die Ausbeute metallischen Eisens von 11 auf 52 % erhöht werden, ohne das 'know-how' der langobardischen Metallurger erreicht zu haben.

Herstellen und Brennen von Keramik

Das experiment wurde gemeinsam mit einer Töpferin vorbereitet. Der Brennofen enstand nach Grabungsfunden von Krevese bei Osterburg.
Die Gefässe wurden in Wulsttechnik hergestellt, allenfalls unter Benutzung der Handdrehscheibe.
Der Aufbau des Brennofens erfolgte über einem Weidengerüst in Kuppelform mit schlotartigem Aufsatz. Der 1. Brennversuch begann mit dem Einsatz von 20 Gefässen. Bisher wurden in diesem Ofentyp 7 Brände durchgeführt d.h. ca. 130 Gefässe gebrannt. Diese waren nach Originalstücken gefertigt worden. Die Bruchrate betrug ca. 12 %.
Langsames Anfeuern (2-3 h) auf 400 Grad erwies sich als notwendig, um den ersten Quarzsprung zu überwinden. Bei niedriger Maximaltemperatur (600-700 Grad) war eine längere Brenndauer vonnöten (4 h), wobei eine reduzierende Atmosphäre entstand. Höhere temperaturen, etwa 800 Grad mussten nur 2 h gehalten werden. Diesmal kam es zu oxidierendem Brand. Im Vergleich bestanden beide Scherben nach Klang und Durchlässigkeit. Der Unterschied lag in der Farbe.

Grubenbrand

Im Versuch wurden kleinere Keramikteile einem offenen Brand in einer Grube auf einem Glutbett unterzogen, das mit Holzscheiten umgeben und nach oben abgedeck wurde. 1/2 h brauchte das Glutbett, danach wurden die Lehmstücke bei ca. 600 Grad hineingelegt. Nach weiteren 30 min. war das Feuer niedergebrannt. Im Anschluss wurde die Glut auseinander gezogen und die Stücke nach dem Abkühlen entnommen.

Rekonstruktion zu Tracht und Schmuck

Die Totentracht ist durch die Inventare der Brandgräber in Teilen überliefert. Die germanische Bekleidung bestand aus Woll- und Leinenstoffen. Die organischen Trachtteile, Bekleidung/Schuhwerk wurden nach niedersächsischen Moorfunden rekonstruiert und nachgearbeitet. Nach dem Beizen folgte die Farbung von Wolle und Leinen in einer Flotte aus historisch überlieferten Pflanzen (Eichenrinde, Birke, Schafgarbe, Heide, Rainfarn, Labkraut), wobei jeweils andere Versuchsanordnungen gewählt wurden und ein Farbspektrum von chromgelb über lindgrün, oliv bis braun entstand. Männer trugen Hose und Kittel mit Bindengürtel, Frauen Rock und Bluse oder ein peplosartiges Kleid. Gürtel und Bänder entstanden in Brettechenwebtechnik. Der Trachtenschmuck bestand aus Fibeln, Schmucknadels, Kämmen und Ketten.

Backen/Kochen

Obwohl für unser Gebiet der archäologische Nachweis für Backöfen aussteht, sollte auch dieser Versuch einbezogen werden. Auf einer Lehmplatte entstand über einem Weidengeflecht die Ofenkuppel aus stark gemagertem Lehm. Sauerteig, im Versuch nach unterschiedlichen Rezepturen hergestellt, und geschrotetes Roggen- bzw. Weizenmehl wurden zu einem Teig verarbeitet, zu Broten, Fladen und Brötchen geformt, die im vorgeheizten Ofen bei ca. 230-300 Grad 20 bis 60 Min. ausgebacken wurden.
Kochversuche in offener Kochgrube aus nachgewiesenen Zutaten haben begonnen. Aus Rinderknochen, gelben Erbsen, Kohl, Thymian, Kümmel und Salz wurde im rekonstruiertem Kochgeschirr Suppe bereitet und getrockenete, zerriebene Löwenzahnwurzeln als kaffeeartiges Getränk aufgekocht. An der Zusammenstellung weiterer Speisen wird gearbeitet.

Spinnen und Weben

Ungewashene Schafwolle wurde mit der Handspindel zu Garn versponnen. Bänder entstehen in Brettchenwebtechnik und Stoffe auf dem senkrechten Gewichtswebstuhl.

Ausblick

Es ist die Rekonstruktion eines Gehöftes des 3. Jh. nach Grabungsfunden der nordwestlichen Altmark mit Wohnstallhaus, Grubenhäusern, Speicher, Brunnen usw. einschliesslich der Vorführungen der Gewerke in diesen Häusern vorgesehen.
Schrittweise sollen nach Forshungsergebnissen auch Teile der ehemaligen Umwelt (Bewuchs, Nutzplanzen, Wildkräuter) rekonstruiert werden.

Dr. Rosemarie Leinweber
(Salzwedel, Germany)

METAL WORKING WORKSHOPS OF THE SARMATIAN BARBARICUM IN THE CARPATHIAN BASIN

Both Pannonia and the neighbouring lowland regions were very poor in metal ore deposits. The lack of metal ore mining did not favour the formation of primary metal production. There are, however, several instances of secondary metal production (e.g., Keszthely-Fenékpuszta or Zalalövő). Further smelting workshops were observed on the following settlements: Aquincum, Arrabona, Brigetio, Carnuntum, Emona, Intercisa, Siscia, Sirmium and Gyulafirátót. The following names of metal working artisans were preserved: from Aquincum, Secundus, from Brigetio, Romulianus artifex bronze-caster masters.
The metal finds of the Sarmatian Barbaricum was found to be, wherever origin could be stated, of local origin, comprising mainly trinkets, coins, lamps and statuettes. While the Dacian metal art was of well-known high level, we cannot speak of the same for the Sarmatians. The reason lies, undoubtedly, in the lack of mines and differences in living circumstances.
In the frames of the Alföld Micro-regional Research project of the Archaeological Institute, metal working has been found documented on two sites of the Sarmatian period. One of them is the site Gyoma-133 (Ailer Brickyards). Here, on a part of the settlement dated to the last third of the 2nd and the first part of the 3rd centuries there were numerous lumps of iron and remains of smelting ovens found. The other site was Örménykút-52, lying not very far from the former. This is a Late Sarmatian manor with many iron lumps. Both sites can be regarded as secondary metal working centres with metal transported from Dacia along the rivers.
A specific feature of metal working could be detected on the Late Sarmatian settlement of Tiszaföldvár-Brickyards. Here, a rich workshop material of re-smelted bronze objects, casts and utensils of production were found in large quantities.

Andrea Vaday
Archaeological Institute of the Hungarian Academy of Sciences

OTHER EVENTS OF ARCHAEOMETRICAL AND INDUSTRIAL ARCHAEOLOGICAL INTEREST

PALAEOECOLOGICAL CONFERENCE

22-23. of May 1992

T. Dobosi, Viola: Archaeological sites between 30.000 and 15.000 BC.

Ringer, Árpád: 1. New data on the Pleistocene stratigraphy, chronology and palaeoecology of NE Hungary between 30.000 and 10.000 BP.
2. Some recent find complexes of the Upper and Late Palaeolithic in Hungary

Kertész, Róbert - Sümegi, Pál - Vörös, István: The history of development on the Jászság region and its etnodinamical characteristics in the Stone Age

T. Biró, Katalin: Utilisation of natural resources in the Neolithic

Borsy, Zoltán: Surface morphological changes of the NE parts of the Alföld (Great Hungarian Plains) from the Upper Pleniglacial

Lóki, József - Borsy, Zoltán - P. Félegyházi, Enikő - Hertelendi, Ede - Sümegi, Pál: Fine stratigraphical analysis of the Bócsa borehole (Duna-Tisza interfluvial region)

P. Félegyházi, Enikő: Detection of human interference on the basis of pollen analyses

Medzihradszky, Zsófia - Járainé Komlódi, Magdolna: European Pollen Database (EDP) - its role and importance in Hungarian palaeo-ecological studies

Sümegi, Pál - Szöőr, Gyula - Hertelendi, Ede: Malaco-thermometer - new palaeo-climatological tool

Kordos, László: The role of palaeoecological experiences in environment protection

Vörös, István: Changes in the great mammal fauna in Hungary in the past 30.000 years (BP.)

Krolopp, Endre - Szónoky, Miklós: Paleoecological studies on the near-surface formations of the Nagykunság (Great Cumania) region

Braun, Mihály - Sümegi, Pál - Szücs, László - Szöőr, Gyula - Hertelendi, Ede: Limnological reconstruction of the Nyírség marshes

Sümegi, Pál: Upper Pleistocene development of the Hajdúság region

Szöőr, Gyula: Geochemical parameters as ecological indicators

GEOARCHAEOLOGICAL MEETING

4th of November 1992.
Lectures and video presentations

Kertész, Pál: Introduction

Simán, Katalin: Upper Palaeolithic workshop and exploitation site (Arka-Korlát)

Arrow-head producing workshop at the Los Millares hillfort (Granada University)

Bácskay, Erzsébet: Results of prehistoric flint mining studies in Hungary

The La Venta flint mine (Granada University)
Biró, Katalin: Raw material studies on prehistoric stone tools
Brian Adams: Edge-wear analysis: method and applications
The Spear in the Stone (Kim Mc. Kenzie. Australian Institute of Aboriginal Studies)
Gálos, Miklós: Static examinations of hanging corridor consoles in the historical city of Székesfehérvár
Juhász, András - Scheuer, Gyula - Szlabóczky, Pál: Provenance and preservation of the building stones of the Diósgyőr Castle
Buzás, Gergely-Varga, András: Carved stones of Buda and Visegrád
Marek, István: Petrological studies on the Lapidarium Hungaricum
Hála József: Ethnographical studies of quarrying and stone carving in Hungary
Rock chant - Folklore of the Gerecse quarries (Lehel László et al., Ethnographical Museum)
Let's have a millstone carved - Sárospatak, Botkőbánya. (Rácz Gábor, Hungarian TV)

From the lectures of the session:

EDGE-WEAR ANALYSIS: METHODS AND APPLICATIONS

Edge-wear analysis is a technique which has been developed to determine the functions of chipped stone tools. In the United States, the technique and methodology has been presented by Lawrence Keeley in Experimental Determination of Stone Tool Uses (University of Chicago Press, 1980). Stone tool edges are examined using a reflecting-light, metallurgical microscope with magnifications of 50x through 400x. Stone tool functions are determined through the interpretation of three types of edge-wear traces: micropolishes, micro-chipping, and micro-striations. Replicative experiments demonstrate that these traces permit archaeologists to recognise tools which were used to work materials such as wood, leather, bone, antler, plant, and shell. In addition, it is possible to reconstruct the way in which a tool was used, e.g. cutting, scraping, drilling, sawing, chopping, etc.
Using this technique, the author has investigated stone tool use at Palaeolithic sites in Egypt and Neolithic and Bronze Age material from Hungary. Early Upper Palaeolithic stone tools from the site of Abu Noshra in Southern Sinai, Egypt exhibit primarily traces produced by butchery and hide-working. Neolithic and Bronze Age stone tools from southern Hungary were used primarily for plant cutting and hide-working.
Edge wear analysis is of potential use in the recognition of activity areas on sites. If the location of retouched artefacts are carefully recorded and mapped during excavations, and these tools are later inspected for wear-traces, then the archaeologist can determine if particular areas of sites were used for specific purposes (eg., hide-working areas, bone-carving locations, etc). Thus, edge-wear analysis can contribute to studies which attempt to reconstruct site-functions. In addition, such studies can assist in the documentation of changes in the organisation of human behaviour over time.

Brian Adams
University of Illinois at Urbana
Urbana, Illinois USA

NEOLITHIC EXCAVATION AND EXPERIMENTAL ARCHAEOLOGY AT CSABDI-TÉLIZÖLDES

The Late Neolithic Lengyel Culture (ca. 2800-2500 BC.) site at Csabdi-Télizöldes spreads over an area of 1.5 km sq. on a 150-200 m rise belonging to a S-E extension of the Gerecse Mts., some 50 kms from Budapest. Excavations have been ongoing here since 1978 on settlement and cemetery features from the early phase of the Lengyel Culture. Around 6000 m. sq. have been excavated so far.
The investigations carried out at present have been complemented using experimental and ethnoarchaeological methodology. This multidisciplinary approach is relatively new in Hungary.
The continued fundamental aims of this project are the introduction and adaptation of experimental and ethnoarchaeological methods to the analysis of a large Neolithic site. A primary initial goal is the reconstruction of Neolithic tool manufacturing techniques and use.

Judit Antoni

COMING EVENTS IN HUNGARY

Meeting of the Industrial Archaology Working Group
2nd of April, 1993 Sopron
Conference on Computer Applications in Archeology and Museology
13-14th of May, 1993. Budapest
Festival of archaeological films and video presentations
20-22nd of May, 1993 Sopron

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