# STUDIJNÉ ZVESTI

ARCHEOLOGICKÉHO ÚSTAVU SLOVENSKEJ AKADÉMIE VIED

45

NITRA

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# Z METODYKI BADAŃ NAD MIEJSCOWĄ PRODUKCJĄ SZKŁA Na podstawie starożytnych i wczesnośredniowiecznych źródeł archeologicznych

#### Maria Dekówna

### On Research Methodology Regarding Local Glass Production. Based on Ancient and Early Mediaeval Archaeological Records

The author draws upon her earlier published work, in which a classification and interpretation of selected categories of glass production relics had been put forward. In view of the fragmentariness and sporadic occurence of written sources on glass-making in antiquity and Mediaeval times, archaeological records must remain the basis for research on this sort of manufacturing. In turn, the specific nature of the material and the complexity of the issues involved demand a somewhat modified research approach, different from that applied to ready-made glass products.

While the present author debates some of the opinions of various scholars, she has taken advantage of new and varied records to document her own suggestion of a classification mentioned above. She also takes up some issues regarding research methods involved in the study of local glass production. In her opinion, the ancient and early mediaeval glass workshop was characterized by the following assemblage of categories of finds: production relics (buildings, other roofed structures, furnaces, hearts, tools, raw materials, slag, glass mass, waste products), half-products, ready products, other. The author goes on to describe summarily the functioning of the ancient glass-making craft and presents examples of waste in the three subcategories. In discussing these finds she also considers the possibilities for interpreting them as the remains of different types of workshops.

# PRÍSPEVOK K TERMÍNOM SILIKÁTOVÝCH MATERIÁLOV POUŽÍVANÝCH V DISKUSIÁCH O PROBLEMATIKE HISTORICKÝCH SKIEL

#### Danica Staššíková-Štukovská - Alfonz Plško

#### A Contribution to the Terminology of Silica Materials Used in Discussion on the Historical Glasses

The article aims to be help through interdisciplinary explication along the way of creation of the professional terms indicating historical silica materials in the context of research of the historical glasses in the Slovak and the Czech scientific literature. The authors of this article have created a classification of the materials according to presence or absence of a glass phase and according to the implemented technology in manufacturing the historical items. This way created basic system has outlined six groups of stuff illustrated with samples from archaeological finds mainly from the Slovak and the Czech republics dated to 2200 B.C.-13th century A.D. They have précised also the specific interdisciplinary terms of glass-crystal stuff made during the glass and ceramic processes and also the names of the materials of the historical glass with corrosion. Beyond the unification of professional terminology this article follows the aim to draw attention to important meaning of the research of the glass-crystal substances for the deepening of the knowledge of the history of development of the technology of production of silica materials. This technology has led to a specialisation of the technology known today as a traditional glass or traditional ceramic production. The article is addressed towards need of the basic research on historical glass in Slovakia, where the absence of professional literature in native language is evident.

# "OLIVOVITÉ" KORÁLIKY - TERMINOLOGICKÉ POZNÁMKY A MAKROSKOPICKÉ POZOROVANIA NÁLEZOV Z POHREBISKA V DOLNÝCH VĚSTONICIACH

Danica Staššíková-Štukovská - Šimon Ungerman

# Olive-Shaped Beads - Notes to Terminology and a Macroscopic View on the Cemetery in Dolní Věstonice

Systematic and non-systematic nomenclature classification on examples of origin and usage of the name "olive shaped" beads which were in the early medieval age spread across central Europe. Detailed description of the types of glass beads, which are in the abstract named "olive-shaped smooth", and "olive shaped lengthwise latticed". General description of shape, dimensions, glass, glass faults, marks (traces) of technical operations, manufacturing technology and ornaments which was done based on macroscopic analysis on 227 pieces of olive shaped beads from cemetery in Dolní Věstonice.

# FAJANSA A JANTÁR V STARŠEJ DOBE BRONZOVEJ

#### Klára Marková

#### Faience and Amber in the Early Bronze Age

Faience as an artificial material is connected with development of pyrotechnologies and metallurgy. In south-western Slovakia it occurs in graves of the Nitra culture. In the terminating classical phase of the Únětice culture the faience was replaced by amber here. In eastern Slovakia faience appeared as soon as in the Košťany culture. Amber occurred later in this

region and in the contexts of Otomani culture beads made of the both materials exist also simultaneously. Analyses proved the amber finds in the Carpathian basin being of Baltic origin. Its spreading to the Carpathian basin was connected with another aspects of metallurgy – uneven occurrence of raw materials and barter.

#### PRAVEKÉ FAJANSOVÉ KORÁLIKY Z HROBU 1 V SPIŠSKÝCH TOMÁŠOVCIACH

Danica Staššíková-Štukovská - Martin Hložek

#### Praehistoric Faience Beads from the Grave 1 of Spišské Tomášovce Site

The basic results of interdisciplinary analysis of praehistoric faience beads (terminus technicus in archaeology) have been presented. They were found in the grave N. 1 at the site Spišské Tomášovce, position 3, Fortification I. Findings of five beads with partially saved layers of glass glaze with turquoise colouring on the surface have been examined. The beads were found in the skeleton grave No 1 of the Košťany Culture from Early Bronze Age. The optical investigation has been made by microscope Jena Vert Carl Zeiss Jena with CCD-Iris Sony camera. The chemical content of the beads has been specified with the help of electronic microscopy (SEM). The petrographic characteristics of the findings have been specified with a microscope Olympus EX50. The conclusion was that the beads were produced probably with the method of cementation and were coloured with the use of oxide of copper.

# SKLENÉ KORÁLIKY V OBDOBÍ POPOLNICOVÝCH POLÍ NA SLOVENSKU Stav výskumu

Václav Furmánek - Milan Horňák - Vladimír Mitáš

#### Glass Beads of the Urnfield Period in Slovakia. State of the Research

The paper deals with the oldest glass products in the Slovak territory, which are glass beads. On this occasion there is pointed out their occurrence in the individual cultural complexes of the Urnfields, the status of research as well as the possibilities of research in the given issue.

The first finds of glass beads in Urnfields in Slovakia occur in the Middle Bronze Age. They occur in all cultural complexes of Urnfields in the Young Bronze Age. Just in this period we record their largest distribution. The appearance of glass beads markedly decreased in the Late Bronze Age.

The glass beads are known mainly from cemeteries. They are almost homogeneous from the typological view. They are unserviceable for the dating of archaeological features. In the present status of research the question of the glass beads provenance remains still opened.

# SKLENÉ KORÁLIKY KYJATICKEJ KULTÚRY

Vladimír Mitáš - Marián Soják

#### Glass beads of the Kyjatice culture

The paper deals with the glass beads of Kyjatice culture. This paper sumarize and interpret the glass beads from two cremation burial grounds (Dvorníky-Včeláre, Radzovce) and from the cave (Háj-Kostrová jaskyňa) from the south of the Middle and East Slovakia.

## MIKROSKOPICKÉ ANALÝZY MATERIÁLU KORÁLIKOV Z HRADISKA KALENDERBERGSKEJ KULTÚRY SMOLENICE-MOLPÍR

Milan Horňák

# Microscopic Analysses of Material of the Beads from the Kalendenberg-Culture's Hillfort in Smolenice-Molpír

The contribution presents results of material analysis of beads excavated in the Kalendenberg-culture's hillfort in Smolenice-Molpír (HC2/HD1 or in the site chronology Smolenice I and Smolenice II). The finds were found mostly at the acropolis (83 beads). No glass manufactures were revealed at the site. Revision of the complicated field situation has précised cultural affiliation of the beads. The article is aimed at exact evaluating of the beads material with special attention to glass. For the analysis a non-destructive method of microscopic photographs was used. As far as their material is concerned a based on

reached results, the beads from Molpír can be divided into four masses: 1 - pure or transparent glass glass (Fig. F29: 1); 2 - imperfectly molten glass (Fig. F30: 1, 2); 3 - glaze (Fig. F31: 1, 3) - surface glassy layer on the bead ceramic core; 4 - ceramics (Fig. F32: 1). The aim of the submitted article is to present only the results of microscopic analyses of beads material, while their more voluminous evaluation was elaborated in the diploma thesis of the author of this article.

#### SKLENÉ KORÁLIKY Z DOBY HALŠTATSKEJ NA VÝCHODNOM SLOVENSKU

Elena Miroššayová - Ladislav Olexa

#### Glass Beads from the Hallstatt Period in Eastern Slovakia

Finds of glass beads from Eastern Slovakia are recorded on several sites. An undecorated red-brown bead from the burial ground in Vojnatina, distr. of Sobrance, from the end of the Bronze Age or the beginning of the Hallstatt period belongs to the oldest finds. Other specimens belong to the young and the late Hallstatt period. The largest collection of glass beads of various types comes from the cemetery in Ždaňa, distr. of Košice-okolie, on the basis of existing finds; this cemetery has been provisionally dated back to the HD stage. Among the glass beads from Eastern Slovakia, types chronologically comparable to finds in the Vekerzug culture within the Carpathian Basin prevail considerably. In a wider cultural context, these glass beads can be compared to the finds from the East-Hallstatt sphere. The specimens from the late Hallstatt settlement in Rad, distr. of Trebišov, rang among rare types with some analogies in the cultures north and east of the Carpathians

### SPIŠ - SKLENÉ NÁLEZY Z DOBY LATÉNSKEJ

Gertrúda Březinová - Marián Soják

#### Glass Finds from the La Tène Period in Spiš Region

Spiš is the region in northern Slovakia with evidence of an intensive settlement in the Middle, Late and Final La Tène periods by bearers of the Púchov culture (including the pre-Púchov horizon). Systematic field-walking collections include also fragments of glass bracelets and beads. The obtained set consists of 12 fragments of bracelets and 41 glass beads from six sites. The biggest concentration of these finds is at two known fortified settlement in Jánovce-Machalovce (distr. of Poprad), position Pod Hradiskom, and in Žehra (distr. of Spišská Nová Ves), position Severný svah hradného kopca (Spišský hrad). The bracelets are of cobalt-blue colour. According to *N. Venclová* (1990) they belong to the types 6b/2 (5 pieces), 7b (3 pieces), 7c (1 piece), 11 (1 piece) and 15 (2 pieces). All these are bracelets that are dated to the Middle La Tène period LT C1-C2 (cca a half of the 3<sup>rd</sup> up to a half of the 2<sup>nd</sup> cent. BC). The beads scale is more colourfull. The set includes small circular beads of cobalt-blue colour, that are prevailing, beads with blue-white layered dots on white, in one case on yellow ground and a fragment of a solid translucent bead of brown-rose colour. The surface is decorated with yellow engraved lines. The mask-like bead belongs to the group of beads with human faces.

# KELTSKÉ SKLO Z BRATISLAVY-DEVÍNA A NAJBLIŽŠIEHO OKOLIA

Gertrúda Březinová - Veronika Plachá

#### Celtic Glass from Bratislava-Devín and Its Closest Vicinity

Several glass artefacts dated to the La Tène period were excavated during the excavation seasons in 1936-1938, 1951-1953 and 1965-2003. The finds include four bracelets, twelve beads, ten ring necklaces, a glass vessel fragment(?) and three pieces of glass raw material. The artefacts are dated to the La Tène stages from LTC1b to LTC2, mostly to LTC2-LTD1. In addition to blue colour, one bracelet of 3a type was made of brown-purple glass that started to occur as late as in the LTD stage. Spectrum of finds is congruent (although in small number) with numerous other Late La Tène sites, where glass production is assumed.

# CHEMICKÉ ZLOŽENIE A TECHNOLÓGIA LATÉNSKEHO SKLA Z BRATISLAVY-DEVÍNA Predbežné výsledky zo spektrálnej analýzy

Miloš Gregor

### Chemical Composition and Technology of La Tène glass from Bratislava-Devín. Spectral Analysis Preliminary Results

Chemical composition of La Tène glass from the Devín castle was set by semiquantitative spectral analysis. Considering the obtained results, all the analysed samples could be classified into the group of sodium-calcium-siliceous glass. Chemical

characteristics reflect usage of sodium flux in the glass production. Big portions of calcium (Ca) and magnesium (Mg) in the analysed samples are indicating flux obtaining from phytohaline plants fly ash, what is characteristic to Mediterranean region. Hence, the glass melt was imported. The semiquantitative chemical composition showed particular elements, which were used as dyeing oxides. A final glass colour depended on the dyeing oxide used and the atmosphere in a glass furnace. Cobalt-blue glass colouring was caused by cobalt oxide (CoO), while paler shades were probably obtained by changed CoC concentration and higher contents of  $\text{Fe}_2\text{O}_3$ , PbO and  $\text{Sb}_2\text{O}_3$ . Dark purple shades were obtained by adding of manganese (Mn) compounds and by reduction atmosphere. Oxidation atmosphere and adding of compounds containing iron (Fe) and copper (Cu) produced olive-green colouring.

#### RÍMSKE SKLO Z NIEKTORÝCH GERMÁNSKYCH SÍDLISK NA ZÁPADNOM SLOVENSKU

#### Vladimír Varsik

#### Roman Glass in Some Germanic Settlements in Western Slovakia

The article deals with the finds of Roman glass vessels from five Germanic (Quadic) settlements in western Slovakia and with two stray finds of early Roman glass beakers (scyphi) fragments. It aims at reconstructing forms and types of imported glass vessels and to follow the intensity of their occurrence in individual sites in connection with their distance from the Roman limes. It confronts the number of imported glass vessels with the quantity of samian ware and discusses the chronology of Roman glass importation to Quadic settlements, which is compared with the presence of glass items in Germanic graves from the Roman period.

#### RÖMISCHE GLASGEFÄSSE AUS DER SLOWAKEI

#### Erik Hrnčiarik

#### Roman Glass Vessels from Slovakia

In Slovakia there are altogether 261 fragments of Roman glass vessels familiar to the scientific audience (i.e. published), which, however, due to the nature of this material do not necessarily have to refer to the real number of Roman vessels. They come from southwest and east Slovakia only and they are not to be found in the area of Púchov culture (i.e. middle and north Slovakia). The first matter discussed in this paper is whether Roman glass was considered a luxury article by the ancient inhabitants of the territory of modern Slovakia. It probably was, but only in the 1st and at the beginning of the 2nd century AD, when a mass production of the blow glass begun and its prize therefore in Roman Empire and elsewhere begun to fall. Another matter discussed is the question of its origin. It was possible to specify the vessels as products of Italian, Syrian, Rhineland's, but above all Pannonian manufacturers (i.e. Aquincum, Carnuntum, Arrabona, Brigetio or Gorsium). Typologically there are three kinds of the vessels: drinking service, table set and cosmetics' vials. There is no archaeological evidence of glass store jars or transport containers. Another interesting phenomenon compared to use in Roman Empire is the fact that none of the glass vessel found in Slovakia was used as an urn for burial purposes and there are no Windows glass present (maybe just between the unpublished Materials from Cífer-Pác).

### SKLENÉ KORÁLIKY A ZVYŠKY SKLA Z GERMÁNSKEHO ŽIAROVÉHO POHREBISKA VO VEĽKOM CETÍNE

# Jaroslava Ruttkayová

#### Glass Beads and Glass Remains from Germanic Cremation Burial Ground in Vel'ký Cetín

Glass beads and remains of glass vessels were discovered at the Germanic cremation burial ground at Veľký Cetín that was dated to the Roman period (the  $2^{nd}/3^{rd}$  or  $4^{th}$  century AD). In Veľký Cetín, the beads were found in ten graves mostly one bead at the grave. In the glass beads assemblage blue ones are prevailing, green beads were found in two graves, three beads together and two white significantly burnt beads were in two graves too. As their shapes are concerned, we have divided the beads from the burial ground at Cetín according to M. Tempelmann-Maczyńska's typology. Except of several characteristic types, beads cannot indicate a grave chronology more precisely. Only when reliably datable artefacts are absent, beads can help dating a grave inventory in outline. Globular beads are the most numerous. Apart from the glass beads, fragment of a glass vessel, a disc-shaped bottom with reinforced ring-shaped rim made of greenish glass and a glass disc-shaped artefact made of violet translucent glass - so-called calculi, a playing stone (collection) were discovered at the burial ground. Some graves included glass remains, often shapeless.

#### RÍMSKE SKLO Z GERMÁNSKEHO SÍDLISKA V ŠALI-VEČI

#### Eva Fottová - Erik Hrnčiarik

#### Roman Glass from German Settlement in Šal'a-Veča

During the rescue archaeological excavation in Šaľa-Veča in 2002 a settlement from Roman Period has been discovered. On the basis of the current analysis of excavated material it can be dated between the second half of the 2<sup>nd</sup> century AD and the first half of the 3<sup>rd</sup> century AD. In this paper an elementary interpretation of 27 glass artefacts will be discussed, of which 15 are fragments of glass vessels, another 11 are fragments of jewellery (beads) and one is a glass bracelet. A broad typological variety has been indicated by the analysis, showing that the vessels here found were not manufactured only in adjacent Pannonia, but also in more distant manufactories of Rhineland. The beads, the most numerous part of the jewellery, were of various shape, colour and size. The glass bracelet is rather a rare find in Slovakia, having only four parallels in other sites from Roman times.

#### SKLENÝ POHÁR Z POHREBISKA Z OBDOBIA SŤAHOVANIA NÁRODOV V ČATAJI

Jozef Zábojník

# Glass Beaker from the Migration Period Burial Ground in Čataj

In Čataj (distr. of Senec) a multicultural site with a dominant settlement from the Neolithic was excavated at a highway building area between Bratislava and Trnava in 1975 under the professional leading of J. Pavúk. Within the works also an inhumation burial ground consisting of 17 graves (Fig. 1) was completely revealed. In the grave 21 a one-legged glass beaker (Fig. 2: 6) was found in a Murga-type jug mouth. Based on the burial finds, the necropolis can be dated to the Migration period, i.e. to the second third or second half of the 5th century.

# KOTÚČOVITÝ PREDMET Z HRADISKA VO SVÄTOM JURE

Július Vavák

#### Disc-Shaped Artefact from Fortified Settlement in Svätý Jur

Basic information about an archaeological find from the Neštich fortified settlement excavation in Svätý Jur. A decorated glass disc-shaped artefact from a surface layer in the test pit VIII, in which pottery dated to the 9th up to the middle of the 10th centuries was found. Shape analogies enable the artefact of Germanic provenience to be dated to the Migration period.

# KE STAVU A PERSPEKTIVÁM STUDIA SKLENĚNÝCH KORÁLKŮ NA PRAŽSKÉM HRADĚ A V JEHO PŘEDPOLÍ

Kateřina Tomková - Eva Černá

# Early Medieval Glass Beads from Prague Castle and Its Surrounding - Current State and Future

Evaluation of the recent knowledge on the early medieval beads collection from the Prague Castle, considering their typology and the research future.

# K TECHNIKÁM SPÁJANIA DVOJ- A TROJFAREBNÝCH SKIEL V 7.-10. STOROČÍ Podľa nálezov korálikov z územia Slovenska a Moravy

Danica Staššíková-Štukovská

# On Technologies of Sealing of Dichromic and Trichromic Glasses in the 7th - 10th centuries. According to Finds from the Territory of Slovakia and Moravia

Basic sealing technologies of coloured glasses that were used as decorations of early medieval beads found in Slovakia and Moravia are the topic of this article. Winding of coloured fibres around beads or application of coloured points were the

most frequent ways of ornamentation. Usage of coloured cords for beads decoration is presupposed to be a new technology. It appears on so-called melon-seed glass beads ("Melonenkernperlen") from the 7th - 8th centuries as well as on olive-shaped beads dated to the 9th - 10th centuries. Intermeshing of glasses of different quality with using of a metal foil is a special way of glass sealing that was used first of all for decoration of transversely segmented beads. The glass-granulation decorated bead from Prša is a rare evidence of both the glassworker's mastery and unusual glass sealing technology.

# ANALÝZA NÁHRDELNÍKA Z MOSTOVEJ K termínom závesok a korálik

## Danica Staššíková-Štukovská

#### Analysis of Necklace from Mostová Site. Contribution to Terminology Regarding "Pendulum" and "Bead"

The article presents analysis of beads found at necropolis in Mostová site. A necklace from a child's grave No. 18 is the object of our attention. It consists of 26 whole and several fragmented beads. Macroscopic analysis of the stuff proved that only two of them were made of glass. Pretty rare are the four pendulums made by a technique of welding of two beads together. The article is aimed in précising of the terms "bead" and "pendulum" usage in the archaeological literature dedicated to historical glass items.