SAS Institute of Archaeology

http://www.archeol.sav.sk

Assessment period 2012–2015

Nitra 14. 10. 2016

History of the SAS Institute of Archaeology

•The Institute was founded in 1939 and is a legal person capable of receiving rights and undertaking obligations independently. It manages assets obtained from its own activity or assigned to finance its functions and business activity. These assets are recorded in its financial and operating records. The Institute of Archaeology of SAS is the oldest and the best personally and technologically equipped institution dealing with archaeology in Slovakia. Its structure includes specialists from other fields of study necessary for effective archaeological research (geology, geophysics, zoology, botany, numismatics, anthropology, etc.).

•The Institute was incorporated into SAS in 1953.

•Currently the Institute is a budgetary organization of the SAS, partially undertaking extra-budgetary activities to increase budget from the own sources.

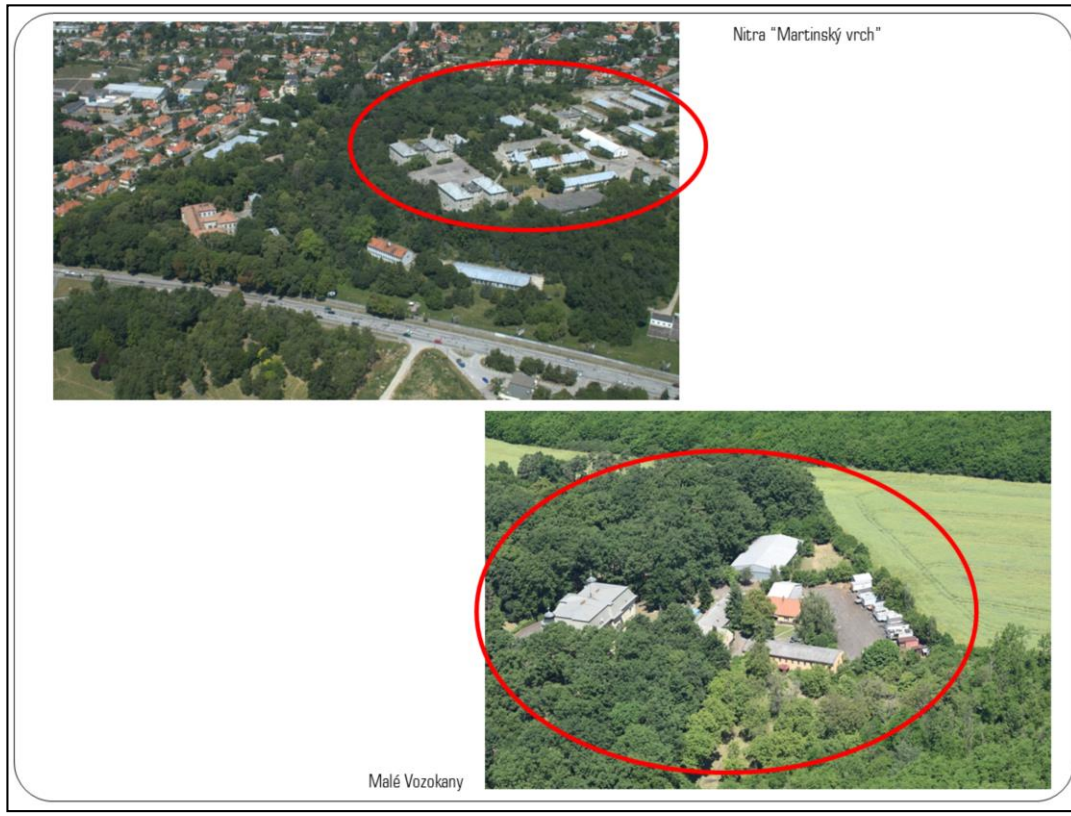
•Slovakian archaeology has traditionally kept close relation and contact with Czech, German and Hungarian archaeology. Its scientific paradigms rooted mainly in German environment. Therefrom also the close scientific language bond on German environment have originated.

The Institute of Archaeology of SAS is the most distinguished expert scientific research institute for prehistorical, proto-historical and historical archaeology in the Slovak Republic. Using scientific methods, it carries out prospecting and recording of archaeological sites, their excavation and theoretical evaluation and publishes the results in European cultural-historical context.

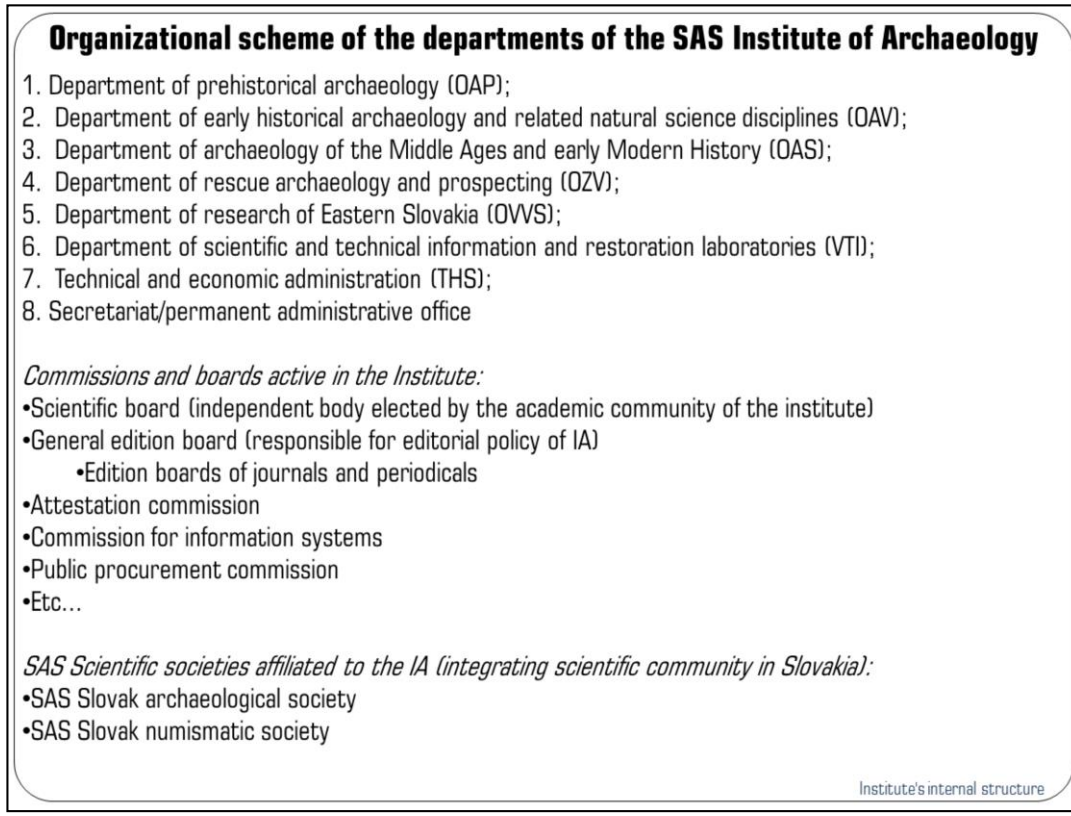
The Institute resides in Nitra.

Department for research of Eastern Slovakia resides in Košice and detached base in Spišská Nová Ves. Their tasks are related mainly to the regions of Eastern Slovakia and neighbouring territories. Detached branch office in Zvolen is focused on the research of Central Slovakia. Both Košice and Zvolen offices are also intensively participating on rescue excavations within their regions. Several research teams work permanently or seasonally at research base in Bratislava, Malé Vozokany, Počúvadlo, Iža and Liptovská Sielnica.

The Institute manages special facilities in Malé Vozokany and Nitra "Martinský vrch". They are used as depositories of archaeological finds and also as places where extensive collections of finds can be processed. Malé Vozokany is also used as a research base for important scientific research projects (e. g. two projects in Vráble carried out within DFG, construction of roads between Nitra and Banská Bystrica, topography of the upper Žitava region, research of an eneolithic settlement in Čierne Kľačany, etc.)



The operation of all Institute´s facilities is logistics, time and finance intense, having almost no support from the state.

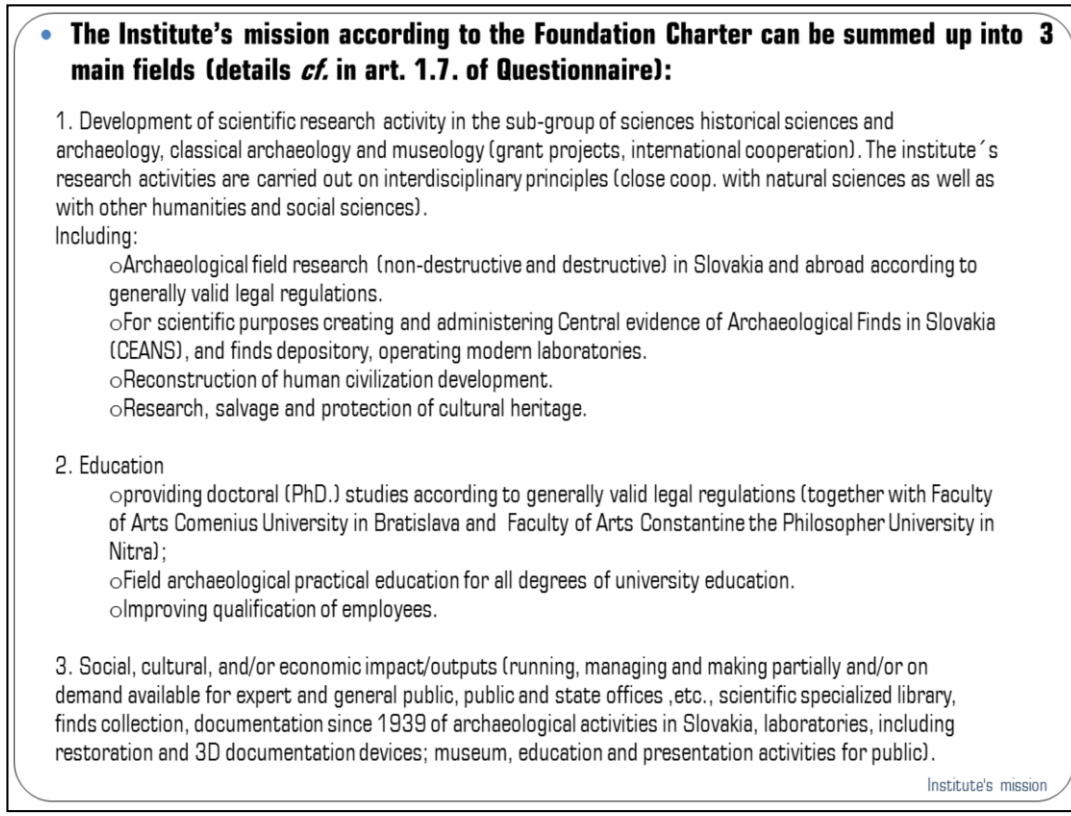


The Institute of Archaeology is a specific organization within Science Department III of SAS. Besides archaeologists, it employs scientists from other fields of study (history, numismatics, geology, geophysics, gemology, anthropology, zoology, botany, museology, geodesy). A large group of technical workers-specialists (chemical laboratory workers, terrain archaeological technicians, conservationists, technical writers, 3D documenters, etc.) is integral part of our work team. This fact is manipulatively reflected in the calculation of the institution's complete payroll fund for scientific workers or their scientific productivity. With regard to the extent of activities and spatial zoning, the institute is the only scientific workplace of Department III of SAS with its own Technical-economic administration.

Organisational scheme correspond with the main three chronological as well as civilisation stages of the historical development as an object of study. The fourth, organisationally cross-sectional, segment is Department of rescue archaeology and prospecting with a specific mission and demanding scientific and managerial role mainly at advance rescue excavations carried out at investment constructions as well as in non-destructive prospecting of archaeological sites (aerial survey, geophysical survey, etc.) and modern 3D documentation and visualisation.

The Department of scientific documentation and chemical laboratories as well as the scientific library (84 474 volumes), Slovak documentation archive, editorial team, scientific depositories, conservation laboratory, draftsmen, photographers are connected with the scientific programme.

Scientific board of the institute cooperates on creation and judging of scientific programm of the Institute, protects the integrity and freedom of scientific research.



The Institute's activities according to the Foundation Charter include:

development of scientific research activity in the sub-group of sciences – historical sciences and archaeology, classical archaeology and museology;

archaeological research in Slovakia and abroad according to generally valid legal regulations;

providing doctoral studies according to generally valid legal regulations. The Institute is a training institution for education of new scientists in the field of archaeology (together with Faculty of Arts Commenius University in Bratislava and Faculty of Arts Constantine the Philosopehr University in Nitra), provides education and preparation of PhD students for the Institute itself as well as for other organizations, provides practical terrain lessons for Slovak and foreign students of all degrees, organizes summer schools of archaeology in cooperation with foreign partners;

providing publishing of the results of scientific research activity in periodicals and non-periodical journals ruled by resolutions of the SAS's Presidium. It edits and publishes: journals of Slovenská archeológia, Študijné zvesti AÚ SAV, the annual Archeologické výskumy a nálezy na Slovensku, Východoslovenský pravek, participates in publishing of the journal Archaeologia historica. Monograph series Archaeologica Slovaca Monographiae, Acta interdisciplinaria Archaeologica, Archeologické pamätníky Slovenska have been active for many years as well as the edition of proceedings from scientific events Communicationes, the series of VARIA and in cooperation with the National Numismatic Committee and the A. Točík´s society, the annual slovenská numizmatika, it published an edition of proceedings from scientific events;

creating and administration of study and comparative collections documenting human

activities in prehistory, early history and the Middle Ages; it manages a collection of archaeological finds from the Institute's investigations;

presents the results of its investigation activities also in form of exhibitions and expositions in Slovakia and abroad;

in accordance with Act no. 49/2002 Coll. on the protection of the monuments and historic sites, it manages and administers the Central evidence of archaeological sites in Slovakia and elaborates expert opinions and statements for self-governing regions, state administration and specialized state administration;

in accordance with Act No. 15 Article 6 Act no. 133/2002 Coll. on the Slovak Academy of Sciences, it can conduct business activities related to its main tasks;

it provides consultations in the fields of archaeology, archaeometry-geophysics, paleozoology, paleoanthropology, archaeobotany,numismatics;

organizes national and international specialized seminars and scientific conferences and congresses;

it publishes specialist and popular-science publications;

carries out archaeological investigations and excavation, including non-destructive surveys (aerial and surface prospecting, geophysics, etc.);

organizes educational programmes (education, presentation of archaeological sites, exhibitions);

elaborates studies and reviews on influences of construction activity on archaeological sites and environment.

The Institute resides in Nitra, Akademická 2. Besides the head office in Nitra, the Institute has the following branches:

Research department in Košice for works in the region of East Slovakia; it includes the base in Spišská Nová Ves;

Research base in Liptovská Sielnica;

Research base in Bratislava;

Detached branch office in Zvolen;

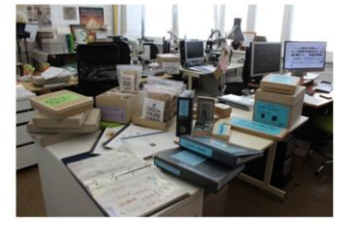
Detached branch office – special facility in Malé Vozokany; Nitra "Martinský vrch"-Dobšinského street;

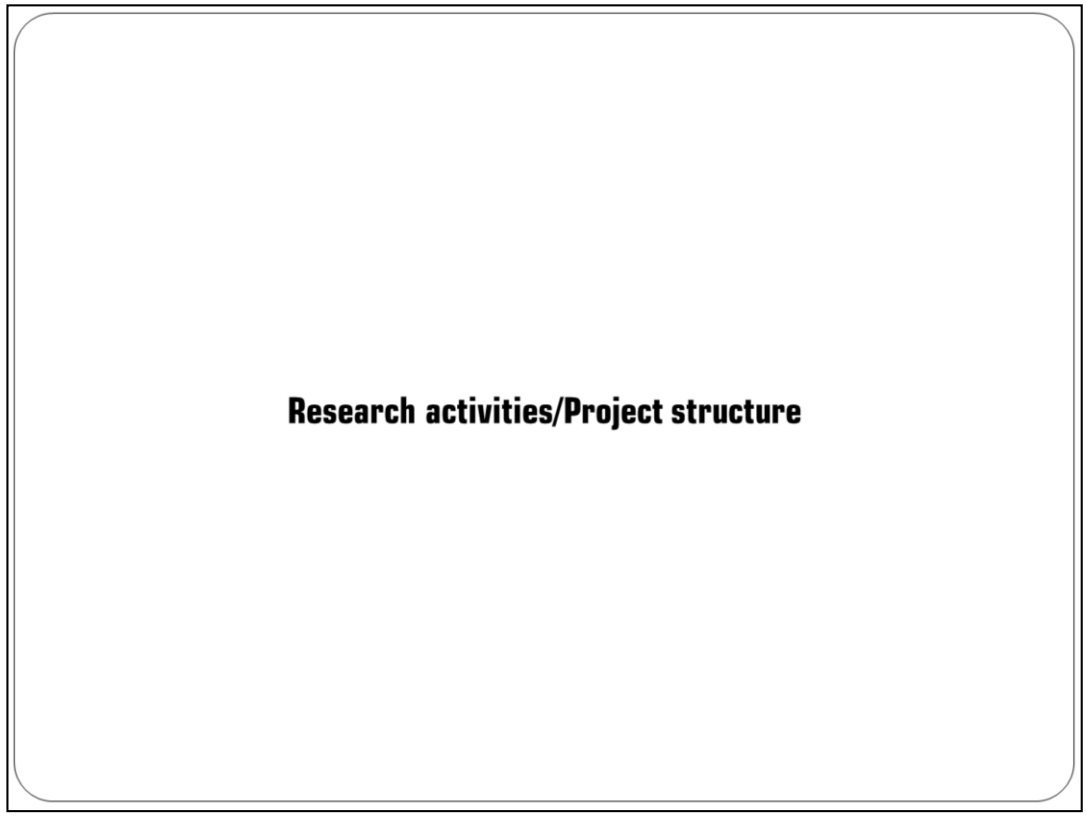
Excavation expeditions in the areas of long-term terrain archaeological investigations (Iža, Bojná, Čingov, Počúvadlo, etc.).

- **Research particularities in the field of archaeology:**

1. Particular needs on personnel (besides scientific collaborators and service workers of the institute, part time workers employed for special tasks, such as frequently and extensively used field labourers, are needed) and technical equipment
2. Field research with extensive administrative, technical and personnel, finance intensive preparation and executive phases, and afterwards time-consuming subsequent primary research (incl. find conservation) to complete standard field report. Only in the second stage the scientific research itself can follow.
3. Besides library, the must for the modern archaeology are modern instruments (mainly used for documentation of finds and sites), equipped laboratories (chemical and conservation, documentation incl. 3D scanning techniques), documentation and material depository departments, interdisciplinary research laboratories (archaeobotany, archaeozoology, anthropology, incl. their storage places with study reference collections).
4. All this makes from the modern archaeology time, space and finance intensive discipline







The Institute's management puts pressure on the scientists to participate in research project in Slovakia and abroad. The aim is to make the topics of domestic and international projects touch **wider questions of the civilisation development in Slovakia and Central Europe, especially the updated concept of history of Slovakia's territory, the relation between man and natural environment, historical process of integration and disintegration of Central European society, relation between the periphery and the centre, relations of communities in different economic and cultural development stages, dynamics of social hierarchy, reflection of spiritual culture in archaeological sources, structure of settlement and its dependence on the geographical environment and economic potential of the region, civilisational relation between Slovakia and other parts of Europe.**

The evaluated accreditation period brought a significant change in the project organization of research. While grant projects of VEGA were the essential factor of the scientific programme in the theoretical part in the past, a new trend has appeared recently – the attempt to obtain more other kinds of funded projects. First of all, the number of applications was higher and better quality, which resulted in more accepted applications thanks to their quality.

The accepted VEGA grants have a rising tendency in number (from 15 in 2012 to 20 in 2015) and funds (from 146,000 to 168,000 EUR). They received high points at accepting as well as at evaluation of their results. All submitted grants in VEGA grant agency are being financed, i. e. we are 100% successful (mostly in A and B category). Almost all

creative employees are members of grant teams. Several projects are being solved in cooperation with univerities (Constantine the Philosopher University in Nitra, University in Trnava, Technical University in Zvolen).

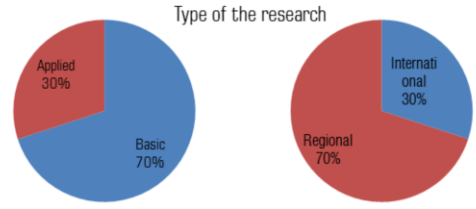
Institute of Archaeology SAS has enforced activities in relation to winning projects within structural funds of the EU. In the evaluated period, the Institute solved two so-called big projects (from 5 applications) and now is preparing two other projects within new call (together with universities). We must emphasize that it is one of the few institutions of social science in Slovakia which has succeeded. Our aim is to compose the projects so that they follow from solving scientific research tasks in connection with other projects and, naturally, with international cooperation. The problem is that the bureaucracy is enormous either in the stage of submitting or during solving. It sometimes results in discouragement of expert solvers (detailed daily reports, etc.). Nevertheless, the situation has improved recently. We also fight lack of quality capacities in some areas (conservation science, IT specialists, etc.).

The number of international grants with participants from IA SAS is on a standardly high level. The Institute has developed intense contacts with renowned institutions in and outside Europe. As a "subcontractor" of some projects, it cooperates with successful ERC projects "The time of Their Life" Cardiff University UK (home page: totl.eu) and "From the earliest modern humans to the onset of farming (45000-4500BP)" University College Dublin, Ireland.

It is positive that in all important schemes, we do not only have an increased number of approved projects, many of the finished projects have been claimed by experts as outstanding.

• Institute´s research activities:

• **Scientific research activity** in the sub-group of sciences – historical sciences and archaeology, classical archaeology and museology includes the theoretical, aimed research coping primary with research interests and needs on national level, being, however, able to match the current research tasks of European archaeology.



	Total 2012-2015		2012		2013		2014		2015	
Project scheme	Nr. of proj.	Budget total	Nr. of proj.	2012	Nr. of proj.	2013	Nr. of proj.	2014	Nr. of proj.	2015
VEGA	35	613 473,55	15	146 482	16	157 824	19	140 336,55	20,00	168 831
APVV	4	459 901,20	2	117 792,20	2	149 491	2	102 406	3	90 212
SAS CE	1	44 881,99	1	39 000	1	3421,20	1	0	1	2460,79
EU SF	3	5 883 371,51	1	560 222,49	1	208 713,87	3	3 666 708,91	3	1 447 726,24
ERA	5	135 460,00	4	53 000,00	3	46 000,00	3	21 000,00	3	15 460,00

Research activities/Project structure

Central topics of the monitored period included partial research of individual eras in the oldest history of Slovakia and Central Europe as well as of a wider territory from the Early Stone Age to the pre-industrial era of the Modern History. This effort is documented by a range of scientific and expert monographs and studies published in Slovakia as well as abroad.

Vertical topics from the aspect of the oldest use of natural resources in the northern part of the Carpathian Basin, paleoecology, archaeobotany, anthropology and archaeozoology were also developed. Special attention was paid to the development of modern terrain prospecting which is connected not only with the database of spatial archaeology but it also extends and identifies the basic fund of the national as well as European cultural heritage in the segment of archaeological monuments.

In this context, winning a scientific research project within the EU's structural funds is extremely important (Research and development, measure 2.1). Within four activities, current processes of archaeology are being dealt with to solve scientific questions as well as make investigation or access to results of scientific work in the field of archaeology and related scientific disciplines less difficult – creation of an research centre, teaching the most modern methods, modern survey of selected areas, conservation science.

New and vital opportunities for basic and applied research are brought by use of natural scientific dating methods on archaeological and historical objects which helps solve confrontation of written sources with archaeological facts and historical models. Investigation of mobility of historical societies moves to new levels by means of DNA tests and analyses of isotopes of metals (strontium, etc.). Several of the Institute' projects

demonstrate its connection with scientific research aims and projects of key European institutions. We also guide the new topics of doctoral works in this direction.

Archaeology is gradually changing into a significantly interdisciplinary field of study and this trend is fully copied by the Institute of Archaeology of SAS.

All experts and specialists actively participate in the scientific research process. We accept the clear global trend – project financing with the attempt to primarily win projects with the time frame of 3-5 years. Projects are a suitable opportunity for the young generation to join the research process and also one of the options how to obtain funds for employing PhD graduates. Here, we use our rich experience of particpation and leadership in international projects.

- **Institute´s research activities (cf. Questionnaire, art. 2.1.5., 2.3.1., 2.3.5.-9., 2.4.1.-7.):**

Project schemes joined:
•VEGA;

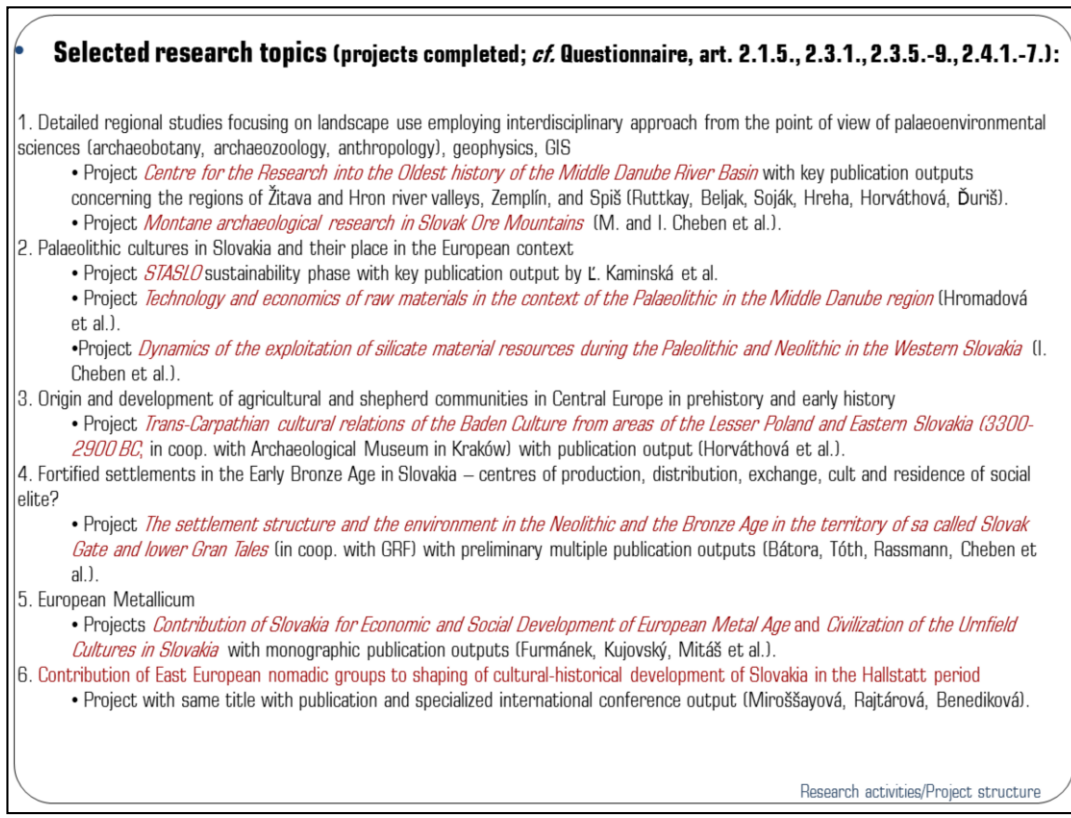
•APVV;

•SAS Centre of Excellence;

•EU structural funds (one of the few institutions of social sciences and humanities in Slovakia which has succeeded);

•International project within EU schemes;

•Out of scheme international projects/subcontracting foreign grants (mostly agreements with scientific partners abroad, e.g. Institute of Archaeology Czech Academy of Science, Prague; Institute of Archaeology Czech Academy of Science, Brno; Régészeti intézet, MTA Budapest; Univ. Budapest; Instytut archeologii PAN Kraków; Römisch-Germanische Kommission des Deutschen archäologischen Instituts, Deutsches Bergbau-Museum Bochum, University of Heidelberg, and others; including some projects funded from abroad, e.g. Vráble, Poprad – GRF grants; partner institutions abroad).



APVV project: Contribution of Slovakia for Economic and Social Development of European Metal Age

Results of the project evaluation have showed enormous potential in the source base of Slovakia for solving the main issues of the dynamics of the historical development in Europe during the Neolithic, Aeneolithic, Bronze and Iron Ages. Large systematic archaeological excavations were followed by their scientific evaluation and publication. Predictive value of this material has been enganced by adequate co-operation with the natural sciences, mainly metallography, anthropology and archaeobotany. These results were published in monographs, proceedings contributions, published home and abroad (see "the most significant publications"). The significance and contribution of the past populations inhabiting the territory of Slovakia was clearly demonstrated for economic and social development of prehistoric Europe. It was a particularly important for development of non-ferrous metallurgy and the related development of other crafts in the period of the beginning of the earliest occurrence of metal artefacts, through the massive occurrence to the period of metallurgy. The subject cannot be assessed as definitively closed. While solving new issues of prehistory, production, exchange, social structures and more have occurred that need further evaluation in future.

APVV project: Dynamics of the exploitation of silicate material resources during the Paleolithic and Neolithic in the Western Slovakia

Tracing the distribution of the silicate rock resources in the Stone Age provides an important tool for understanding the economics and mobility of individual societies during this period. Basic attribute of the study is the evaluation of chipped stone industry

and the determination of origins of the exploited resources, which occur in the ensemble of finds on the individual sites. When evaluating observed problems it is necessary to relate to the geological-petrographic analysis as well to consider the complex technological analysis of the stone silicate artifacts. The main aim of the proposed project is the study of a production technology and a typological analysis of the chipped stone industry. Main goals consist of the determination of form and purpose of import of the material to the settlement, its transformation and the identification of an artefact. It is a product that was the purpose of its production. Information gathered from the individual sites can be compared within certain time frame, as well as between various time frames. Results can refer to the development of production technologies during the Stone Age, from the process of obtaining the material, the primary treatment and the distribution to the final usage in western Slovakia. The adaptation of populations is reflected in the organization of settlements and also in the means of obtaining of the material, which is closely related to cultural aspects.

APVV project: Central Europe between the Celtic Oppida and the Ancient Slavic Centres of Power

Geographic and communication attributes, and raw material sources of Slovakia constituted the remarkable preconditions within the Central Europe for establishment of over-regional centres of power. Analyses, evaluation, and comparison of Celtic, Germanic, and Ancient Slavic settlement of our territory will enable an access for expert as well as public audience to the unique sites of European importance. At the end of year 2015 new sites in hinterland of Bojná centre of power has been discovered. Sampling of the sites in Liptov region yielded new information, whose outputs were presented in a scientific study and at the project web site. Successfully were proceeded also long-term analytical laboratory and conservation works of the chieftain tomb from Poprad. Important were presentations of the project team members at international forums with lectures and posters. Information about the course of investigations of project tasks can be found on the project web site where current information about the project works are published, as well as the first outputs of the project co-investigators. Project activities include also popular-scientific events.

APVV project: Early medieval centres of power (central Danubian region)

The field research, progresive natural scientific analysis (as geophysic, micromorphology, dendrodating) as well as the theoretical studies contributed considerably to broadening our knowledge about the historical roots and establishment mechanisms of the centres of production and power. The time and reasons that led to the establishment and extinction of large agglomerations were specified; the economic,

strategic and political reasons of their establishment were investigated, as well. To the remarkable contributions belongs the discovery of a new Early Medieval centre of power in upper Nitra valley region. It was determined that also the centres of power of the previous periods of the Celtic and Germanic occupation of the Middle Danubeian region, with remarkable concentration at the territory of Slovakia, originated according to the same principals of demographic and economic growth. The main sites of interest of the research within the project – particularly Nitra and Bojná, with many new finds of material culture, as well as theirpresentation in the form of audiovisual and exhibition projects and model reconstructions – gained considerable response in the society home and abroad in favour of Slovak science. For the large scope of the researched topic, discoveries of new sites and emersion of new problems it was not possible to conclude the research completely and it will be necessary to continue the in-depth investigation on the qualitatively higher level.

Ancient Slovakia...: The project was focused on presentation and summarization of exceptional achievements of Slovak archaeology within terrain research as well as in the theoretical field. Nine project teams were created to separately elaborate and publish results of key investigations from the territory of Slovakia in numerous monographs and studies. They cover the time span from prehistory, through early history through the Middle Ages to the beginning of early modern history.

CEVNAD: The project was focused on investigation, preferentially non-destructive surveys of archaeological sites of Slovakia and rescue of cultural heritage. ISAU – an information system containing information on archaeological investigations in Slovakia since 1939 when the Institute was founded – was created. A technological centre for detection of archaeological sites by means of modern methods was established. Extensive series of non-destructive surveys were carried out as a base for elaboration of detailed archaeological maps (Spiš, Zemplín, lower Hron region, Ipeľ region, upper Žitava region). For the first time, LIDAR scans were intensely used to make multiple new discoveries. A new discipline was developed – 3D archaeology, restoration and conservation laboratories were updated. Successful solving of the project was a break point in the material and technical equipment of the Institute which was promoted to the top European level. Simultaneously, numerous new investigation methods were tested involving interdisciplinary domestic as well as international research. Our knowledge of the ancient development of selected regions was considerably changed. A collection of monographs and scientific studies as well as new international research cooperations are the results. Besides a large number of scientific outputs in form of monographs, studies and articles, experts from the Institute of Archaeology focused also on presentation of

their results to secondary and primary schools where the finds from the nearest surroundings were presented to pupils.

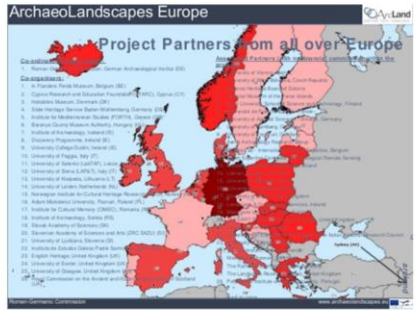
STATE of the art: The goal of the project was to improve quality of the technical infrastructure and thus, increase the ability of the insitution to effectively cooperate with research institutios in the European Union. During the project, it was possible to reconstruct and modernize laboratories, ICT networks and equipment. New scientific depositories were built where archaeological cultural heritage is safely deposited. New software was purchased to support non-destructive surveys and demanding processing of 3D data. Within this project, a programme for collecting information on archaeological finds (find situation, depositing, chemical interventions, restoration, lendings, principles of protection, etc.) was developed and is now integrally connected with the Information system of the Institute of Archaeology of SAS.

Preservation: In close cooperation with Bratislava as the capital of the Slovak Republic, we participate in the scientific research, renovation and revitalization of one of the most eminent monuments in Slovakia – the castle of Devín.

Selected research topics (projects completed; details *cf.* in Questionnaire/2.4.1.-3.):

- International project within EU schemes:
  - Culture 2000:
    - ✓ *Archaeolandscapes Europe 2010 – 2015*
    - ✓ *European castles as centres of cultural exchange in the Middle Ages 2011 – 2012*

- Out-of-scheme international projects:
  - *Dating and structure of Early Medieval hill forts in Slovakia 2004 – 2014*
  - *Research on large collection of finds from a princely tomb from the end of the 4th century at Poprad*
  - *Archaeological excavation of the settlement and burial ground in Vráble*
  - *Archaeological research on prehistoric features Mountainous mining in Špania dolina*
  - *New methods of investigation of archaeological finds – strontium analyses*



Research on large collection of finds from a princely tomb from the end of the 4th century at Poprad

Parts of tomb equipment as well as clothes and garments of a buried young man were revealed in *in situ* collected blocks when they were put under a surgical microscope in laboratory. Items which are rarely found in other archaeological situations were discovered here in a rather good condition. It is fascinating to see particular leather garment or hat decorations, parts of the robe covering the dead body, a leather bow case, fragments of textiles with golden threads or wooden parts of the tomb's construction, sarcophagus, wooden furniture, bier. Thanks to GIS processing, we can literally trace gradual penetration of ancient tomb robbers (tools show that there were probably four of them) – what tools they used to break the construction, what sort of light they used and how they gradually removed exclusive finds from the underground chamber. Investigation of the tomb is a great example of interdisciplinary cooperation from dating methods through anthropology, zoology, botany, chemistry, DNA, physics, to determining the original colours of textiles or the buried person's background.

Output: A collection of publications and work seminars in 2015. In 2017, installation of a complex exhibition featuring the tomb is planned in the Podtatranské Museum in Poprad. In 2016, we would like to present a selection of finds and reconstructions in one of the political institutions of Slovakia (Parliament, Ministry of Foreign Affairs or Embassy of Germany) as part of the Slovak Presidency of the EU Council.

Archaeological excavation of the settlement and burial ground in Vráble

The investigation focused mainly on uncovering of a burial ground from the Early

Bronze Age (2000-1500 BC) which is situated 300-400 m south of the fortified setllement of Fidvár. Most of the burials had been secondarily opened in the past – for ritual purposes or by robberies. However, pottery, bronze ornaments (earrings, pins) and amber beads were found in them. Judging from the size of the burial ground, we can assume that the population of the setttlement in the early Bronze age reached 1,000, which is very unusual for that period. Its proto-urban architecture as well as exceptionally high concentration of population have changed our recent knowledge of the Early Bronze Age in Central Europe (cognition of cultural influences and contacts between the region of Central Europe and distant cultural areas of Eurasia and the Caucasus as well as eastern Mediterranean – Mycenaean culture – in the beginning of 2000s BC).

Archaeological research on prehistoric features Mountainous mining in Špania dolina

Within this project, a vast terrain prospecting of mining works in the territory of the central and upper Hron regions was carried out. The aim of the prospecting was to detect remains of prehistoric mining activities related to copper ore. The emphasis was put on the areas with the largest potential for finding traces of prehistoric mining. It was mainly the area near Ľubietová, Poniky and Špania Dolina. During terrain prospection, a large area was investigated and adits, pinges, dump cones, etc. were thoroughly documented.

New methods of investigation of archaeological finds – strontium analyses

In 2015, first results of a project focused on monitoring migration of archaeologically documented populations were obtained. The method is based on the fact that strontium occurs in four stabile isotopes and nuclide of strontium 87Sr is created in time by decay of radioactive rubidium 87Rb. From the substrate, strontium gets into plants or water and as food, it gets into bodies of animals where it accumulates while they grow. Thus, if a change in the content of isotopes in the buried body and its surroundings is detected (teeth are the best sample), it is clear that the individual did not grow up in the given environment. Thanks to the cooperation with BOKU university in Tulln, first all geological bedrocks of the upper Žitava region, plants and streams were sampled and later, samples from the burial grounds in the residential area of Tesárske Mlyňany were analyzed. It was discovered that the community burying in the area in the Great Migration Period had not arrived from distant territories, as it had been supposed on the basis of archaeological finds. Further employment of this method can significantly change our current views of the migration trends in the past.

Dating and structure of Early Medieval hill forts in Slovakia

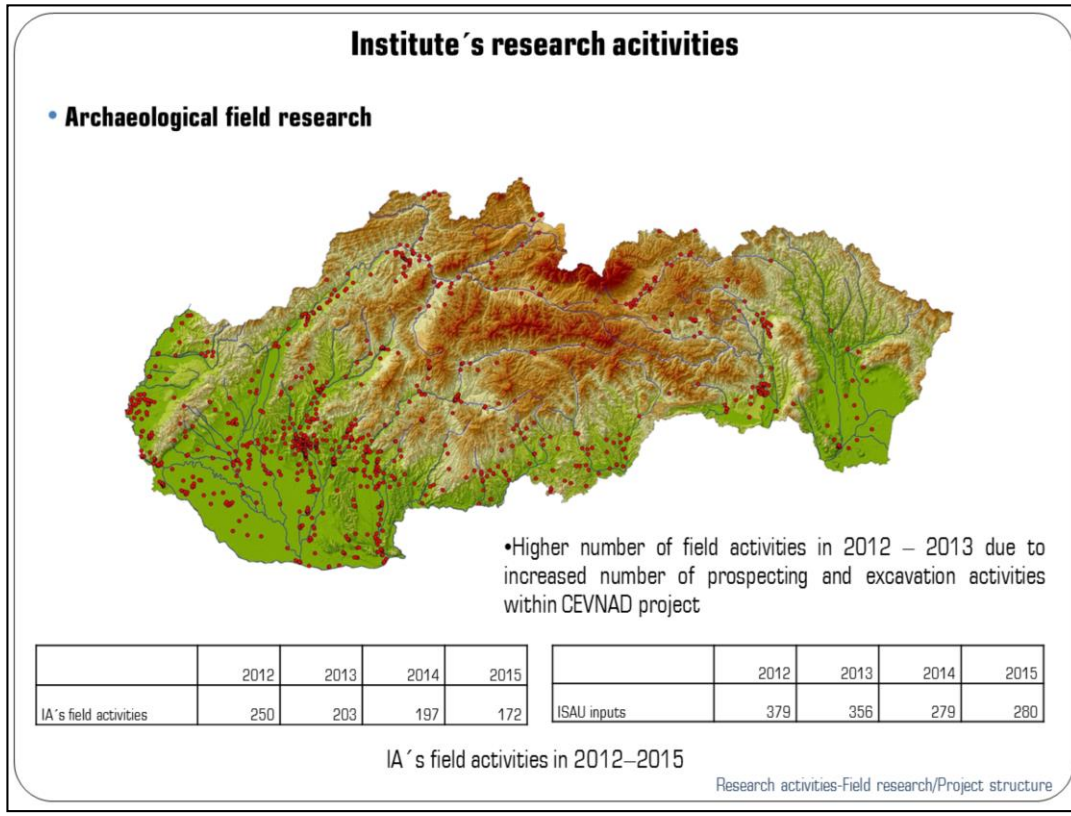
It was an extensive project in cooperation with the Goethe University in Frakfurt in 2004-2013. Within the project, fortifications on the sites of Majcichov, Pobedim, Nitrianska Blatnica, Bíňa, Zemplín and Bojná were studied. Researches and geophysical measurings were carried out on these sites. On the basis of the results of these activities, areas suitable for archaeological investigation were detected. The research focused on detection of construction elements of fortification and on exact dating. The project included collecting C14 samples, dendrochronological samples and samples for micromorphology. Numerous interdisciplinary analyses have brought fundamental progress in dating of the early

Middle Ages in Slovakia and Central Europe.

Archaeology is significant interdisciplinary field of study and this trend is fully copied by the Institute of Archaeology of SAS.

New and vital opportunities for basic and applied research are brought by use of natural scientific dating methods on archaeological and historical objects which helps solve confrontation of written sources with archaeological facts and historical models. Investigation of mobility of historical societies moves to new levels by means of DNA tests and analyses of isotopes of metals (strontium, etc.). Several of the Institute' projects demonstrate its connection with scientific research aims and projects of key European institutions. We also guide the new topics of doctoral works in this direction.

All PhD students are part of research project teams and various types of grant projects. Results of their investigations are presented in preliminary outputs at national as well as international scientific events and in publications.



	2012	2013	2014	2015
IA´s field activities	250	203	197	172

	2012	2013	2014	2015
ISAU inputs	379	356	279	280

819 field activities in 2012 – 2015 , including destructive and non-destructive activities, such as prospecting, rescue excavations, systematic excavations, excavations for scientific and documentation purposes.

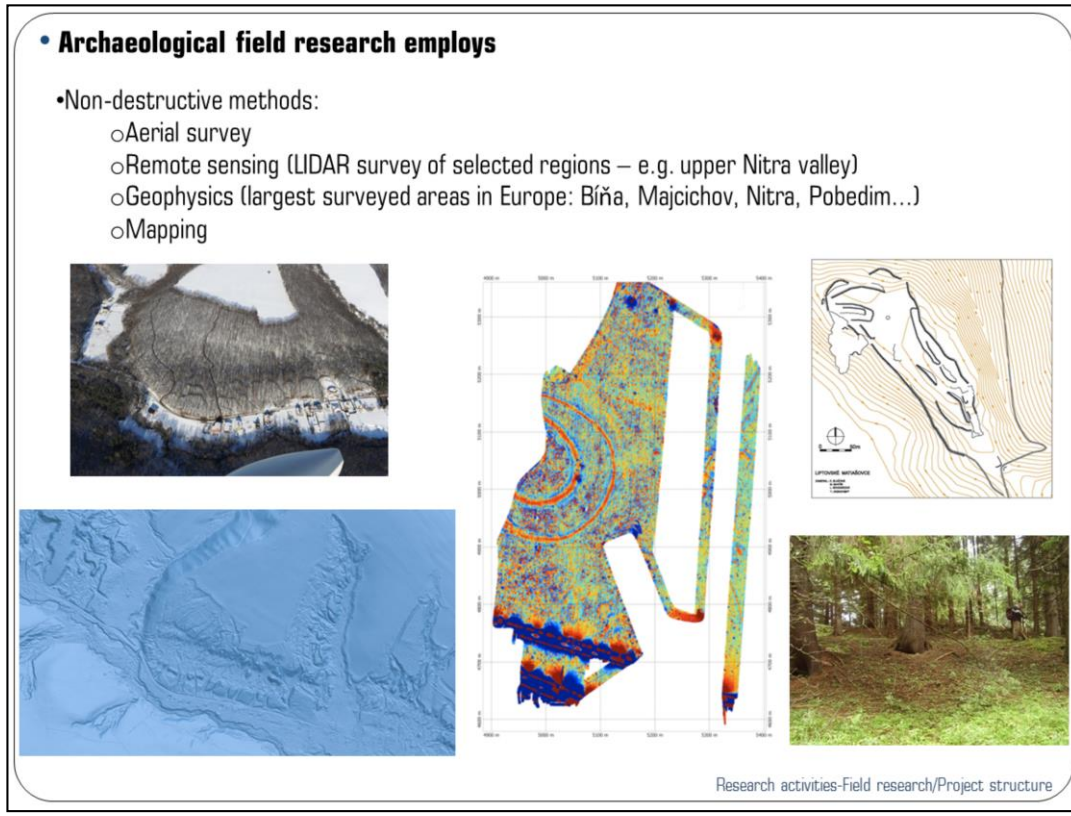
Almost 1300 ISAU inputs in 2012 – 2015.

The basic research is the vital part of scientific research and applied research is also its natural part. In recent years, besides analyses of new funds, we enforced the trend of processing older excavations as main tasks for either our workers or doctoral, master and bachelor works' topics. We managed to provide funds for projects of systemetic terrain excavation (Bojná, Nižná Myšľa, Cinobaňa, Zvolen-Pustý hrad, Nitra-castle, Bíňa, Santovka, Rybník, etc.). Thanks to this opportunity, we can carry out targeted scientific research followed by prompt publishing of its results.

Participation in archaeological rescue research is essential for knowing, saving and protection of archaeological cultural heritage. The largest such researches include a collection of excavations at highway constructions in northwestern and western Slovakia, investigation and discovery of unique Roman architectrues in the Celtic environment (unique in the territory north of the Alps) at the castle in Bratislava, excavations in Košice-Hradová, Zvolen-Pustý hrad, Nitra, Bzovík, Štrba-Šoldov, Prešov, etc. Hard and strict deadlines in the contracts with investors motivated our investigating teams to work harder and more effectively, to finish prospecting and documentation works faster and professionally evaluate their results. This can only be achieved by strict rationalization in terrain work, especially introducing modern equipment and technology.

To maintain all scientific parameters in prospecting, documentation and evaluation of results in this almost serial performance of investigation, the Department of rescue archaeology and prospecting plays a great role. It deals with complicated questions of contractual relationships with investors, realisation of necessary surveys and investigations, providing workers from the Institute and other institutions in Slovakia. In the evaluated period, hundreds of large and small investigations were carried out.

In the concurrence environment we prepare projects for the scientific research activities that are part of the basic research in the field of archaeology. Numerous archaeological excavations yielded extraordinary results and obtained facts contributed to the theoretical solving of typological, chronological and cultural realtionships at different stages of the human society development in Central Europe. Rescue archaeology is an accepted and dominant form of field archaeology in much of Europe. Most archaeological data are collected in this field of archaeology, and many of the methodological inventions in archaeology are made during rescue excavations.



New methods of investigation of archaeological sites

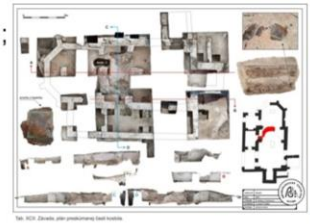
Thanks to projects from structural funds, extensive aerial scanning (LIDAR technology) of selected areas of Slovakia was provided for the first time. The areas included Považský Inovec, Tribeč, Strážovské vrchy (Strážov hills) and Pohronský Inovec. In a result, unique 3D images of the terrain in high definition were obtained. They profide fantastic documentation of known sites and at the same time, a high number of unknown fortifications, tumuli, extinct routes, fishponds, mining areas and other features stood out. It immediately enabled us to target new investigations more effectively. The greatest progress was made in discovering new fortified areas near the well-known hillfort of Bojná. A new extremely rich prehistoric and Great Moravian hillforts in Strážovské vrchy (we do not state the site on purpose) as well as tumuli and hillforts in the Tribeč hills were thoroughly documented. 3D data will be further analyzed and in 2016, we plan to scan other areas.

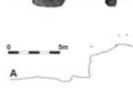
Outputs: 3D models used for exhibitions and presentations; publications and studies.

- **Archaeological field research employs**

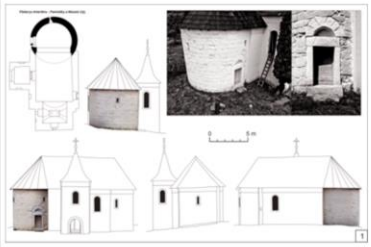
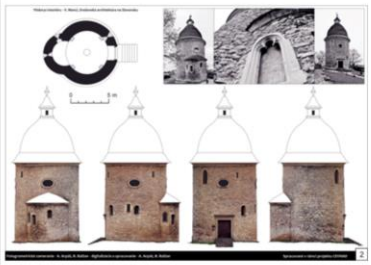
•Destructive methods

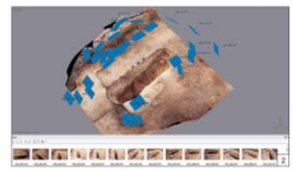
- ○Archeological excavations: rescue and systematic/for scientific-documentation purposes
- ○Standard as well as modern technologies employing documentation methods:
  - ✓field drawing, field photography;
  - ✓total station measurements;
  - ✓photogrammetry;
  - ✓dron documentation;
  - ✓field 3D scanning;
  - ✓find 3D scanning.

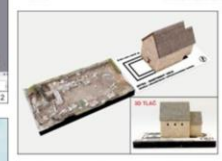
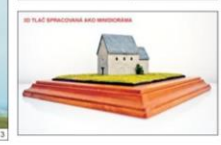
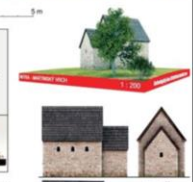




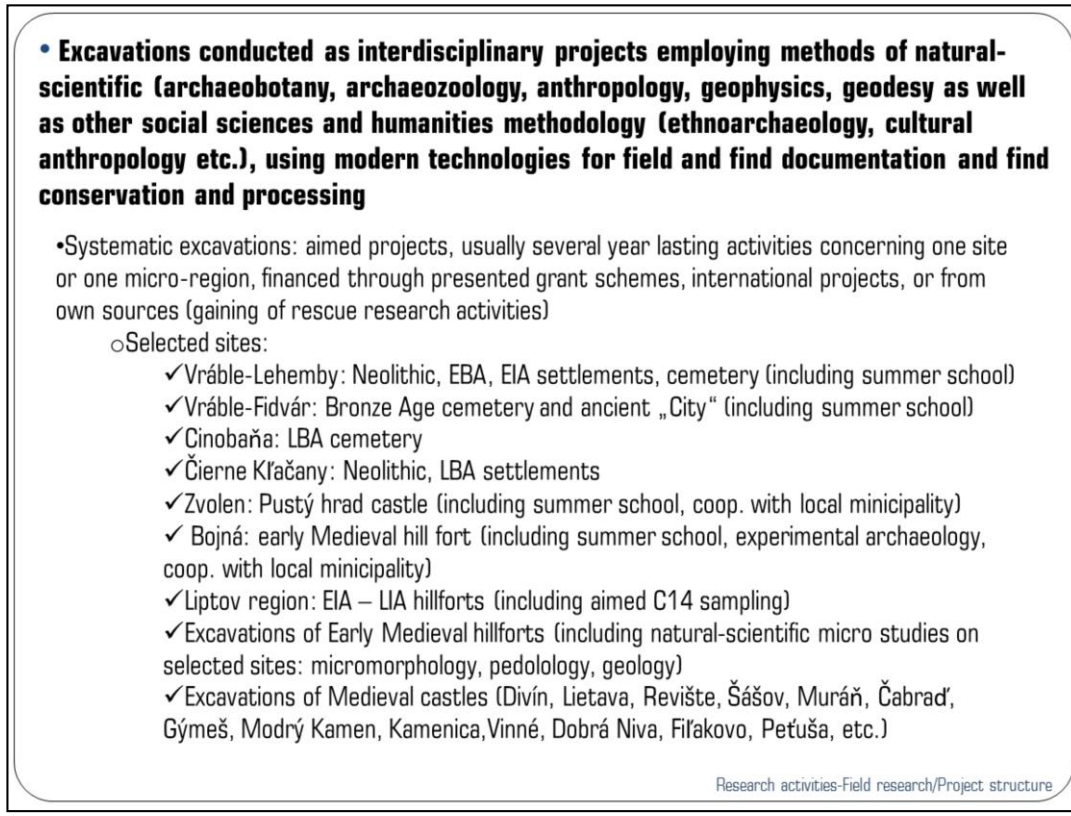
- **Archaeological field research**
  - Modern field documentation – above- and underground structures

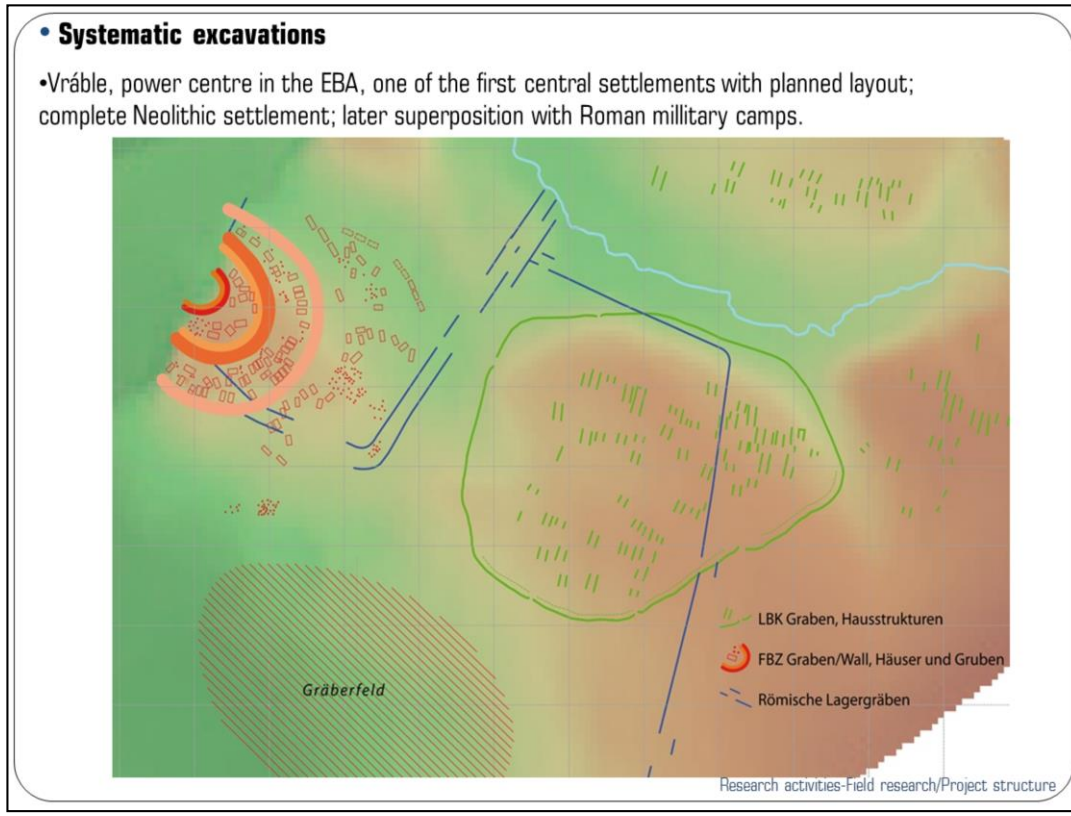



Research activities-Field research/Project structure



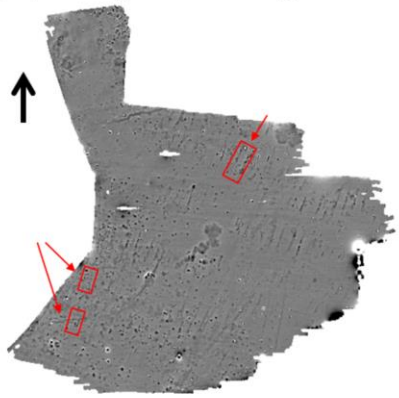
Besides rescue activities Institute was in 2012 – 2015 able to find sources also for (continuation of) systematic excavations/excavations for scientific-documentation purposes.

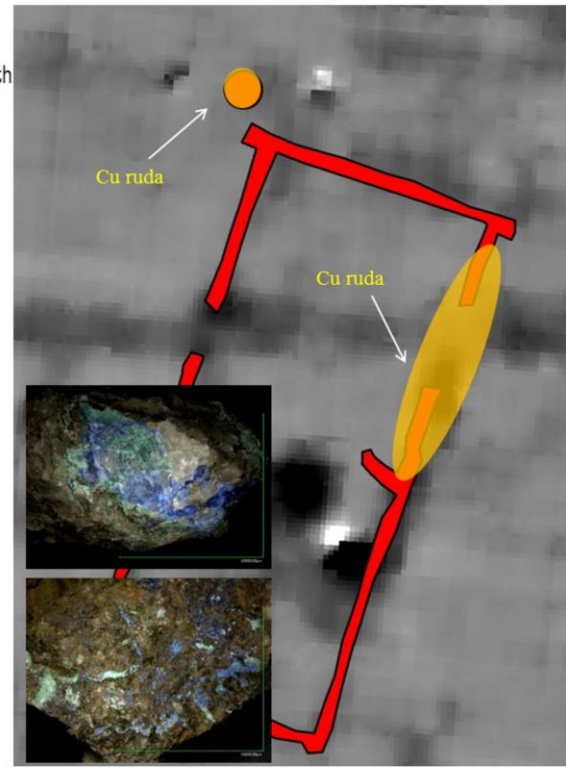


In cooperation with Bergbaumuseum Bochum, RGK Frankfurt, and Christian Albrechts-Universität Kiel, partially financed from own sources.

- **Systematic excavations**

•Čierne Kľačany: Neolithic and LBA/EIA settlements with copper processing (ancient technology research).





• Systematic excavations

Iža, Roman fort

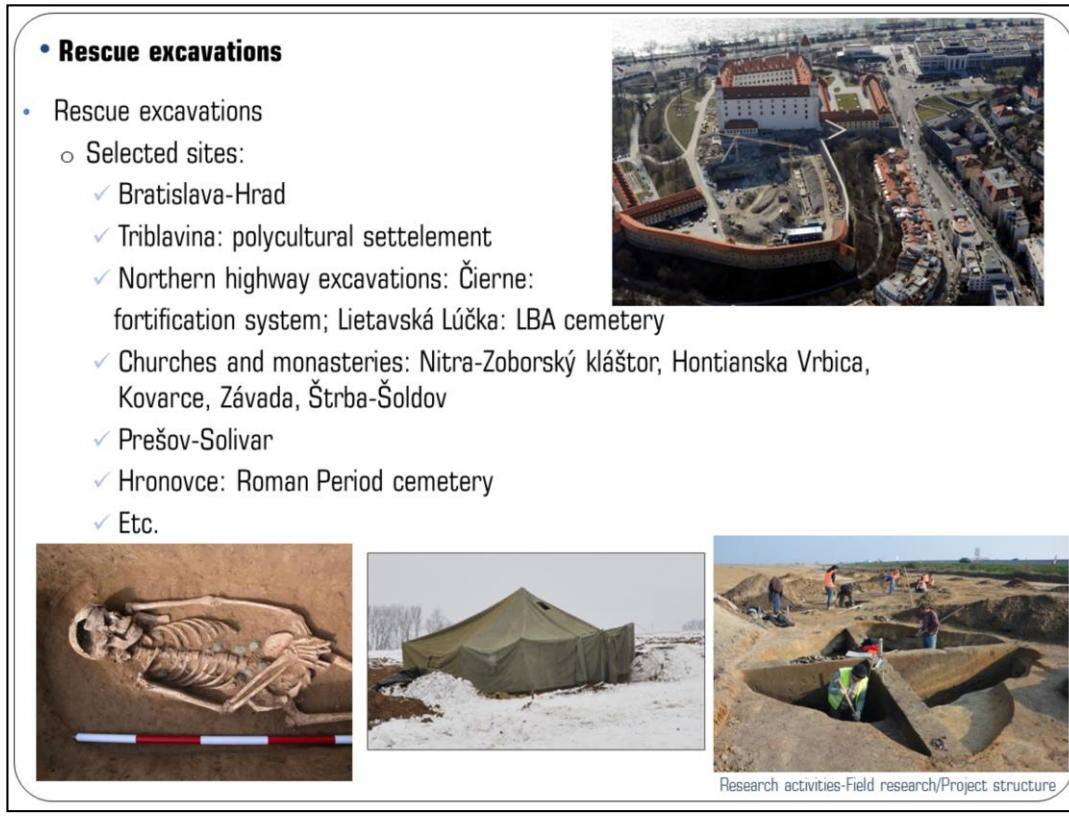
Čierne Kľačany, on-settlement pit burial

Cinobaňa, cist grave (urnfield cemetery)

Liptovská Sielnica, LIA rampart

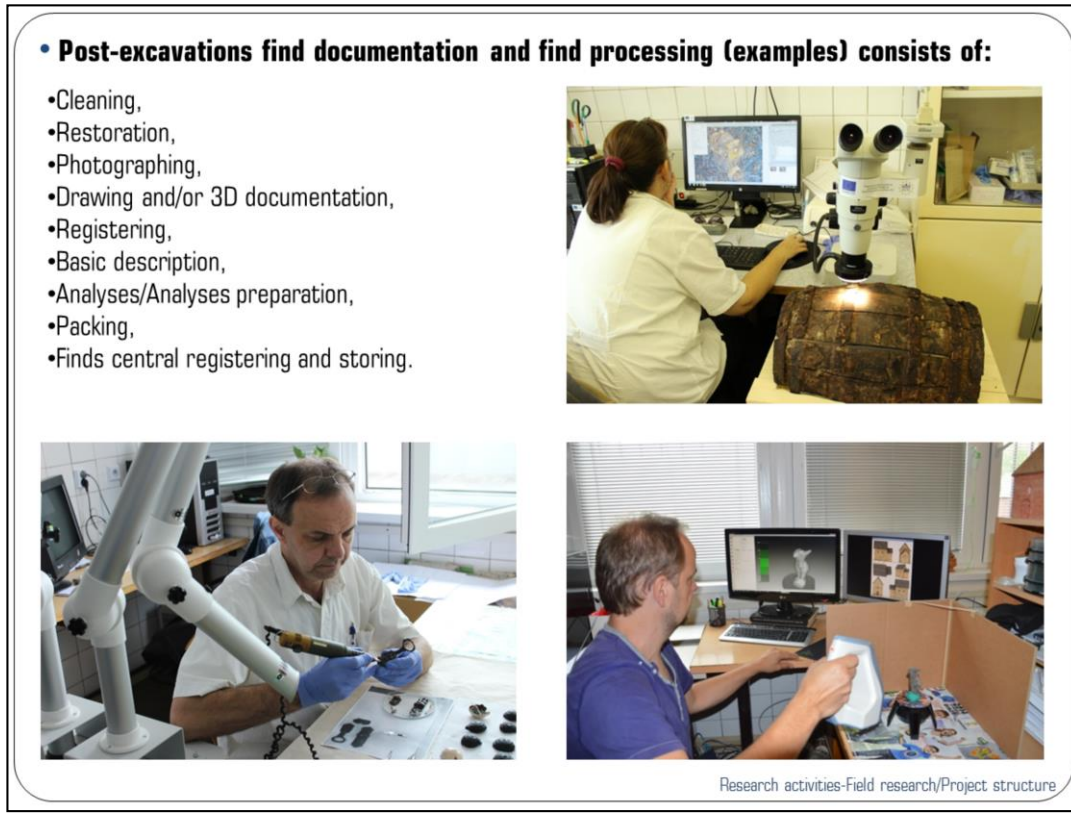
Zvolen, Medieval castle Pustý hrad – cistern

Lietava Medieval castle



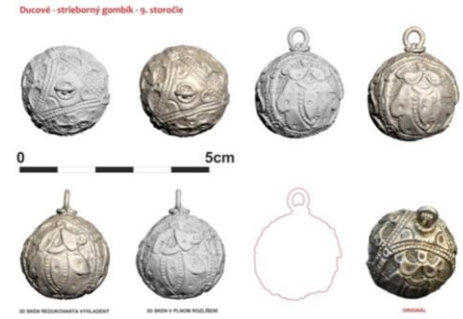
Rescue research is conducted in Slovakia according to generally valid legal regulations (act No. 49/2002) and in accordance with Act No. 15 Article 6 Act no. 133/2002 Coll. on the Slovak Academy of Sciences, that enables condunting business activities related to its main tasks. Finaces gained by these activities are further used for scientific and infrastructural purposes.

The Institute of Archaeology closely cooperates with investors. In case of positive archaeological investigations, it provides presentations for employees by installing permanent expositions in administrative buildings, shopping centres and factories (Municipal Office in Dolné Lefantovce, Branč, TESCO Nové Zámky, TESCO Bratislava, ARAVER Nitra, Sereď – logistics centre of Lidl, Mochovce – administrative builiding of the nuclear power station, SONY – Nitra, Laugaricio Shopping Centre – Trenčín, etc.).

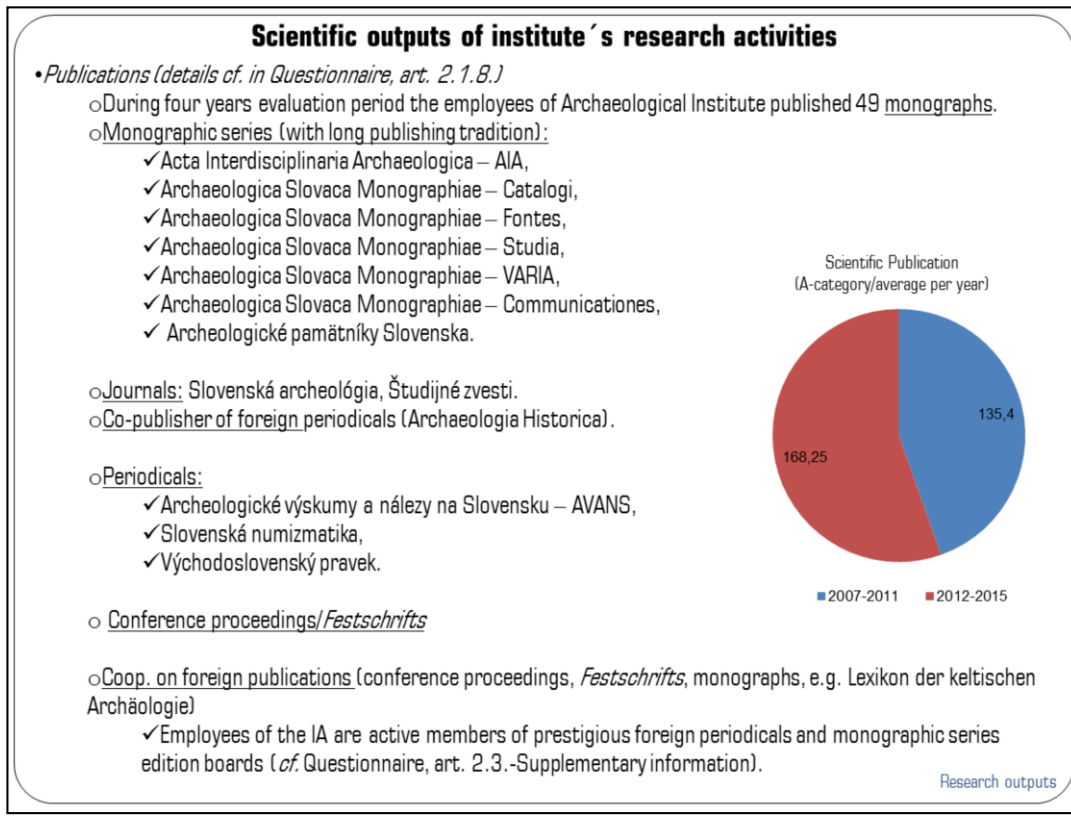


Details in part to Infrastructure.

- **Post-excavations find documentation and find processing (examples)**



Research outputs



Publishing activity of the Institute is standardly on a high level. In the monitored period, we managed to erase the lag in preparation of the respected scientific journal Slovenská archeológia, which has been published twice a year since 1953. It reaches full periodicity, is included in the ERIH database and currently, steps have been taken to register it with SCOPUS. Young researches more often participate in publishing. Since 2010, the Institute has started to prepare publishing of the full content of its periodicals on the internet. With regard to copyright laws, this process is complicated (authors' permission for publishing). However, we assume that in 2016, we will be able to start publishing. All issues of Študijné zvesti, Slovenská archeológia and AVANS as well as many other titles published since 2004 have been available on the internet since 2013 (http://www.cevnad.sav.sk/%C5%A1tudijn%C3%A9-materi%A1ly.html).

The so-called false periodicals include Archeologické výskumy a nálezy na Slovensku – AVANS, Slovenská numizmatika, Východoslovenský pravek, and monograph series Acta Interdisciplinaria Archaeologica – AIA, Archaeologica Slovaca Monographiae – Catalogi, Fontes, Studia and VARIA, or Archeologické pamätníky Slovenska. All mentioned monograophic series of the Institute have long publishing tradition, they are distributed all over Europe and are frequently cited home and abroad.

The Institute has a rich library whose fund is enriched by purchases from project sources and mostly by exchanges with our partners. The library is open to public. In the monitored period, we started to digitize the library records (so far, all monographs and majority of periodicals have been included). It makes working with literature much

easier, as well as checking physical presence of the publication in the library, access to new publications, etc. Many non-institutional publications and studies in digital form are also available via the intranet.

The Institute of Archaeology organized many international scientific events in 2012-2015. In relation to them or following them, it published valuable proceedings. The most distinguished international events with predominance of foreign investigators include the conferences of RURALIA 2013, Grundprobleme 2012-2015 and others. The Institute also organized two meetings of EAC – European Archaeologica Council in November 2011 and January 2016.

From cooperation on other prints abroad, the essential contribution of our employees (as authors and/or as /co-/editors) has to mentioned to the publication Lexikon der keltischen Archäologie, Oxford Handbook on the European Bronze Age, Moravské křižovatky, Hajná Nová Ves, etc.).

Presented is prints selection.

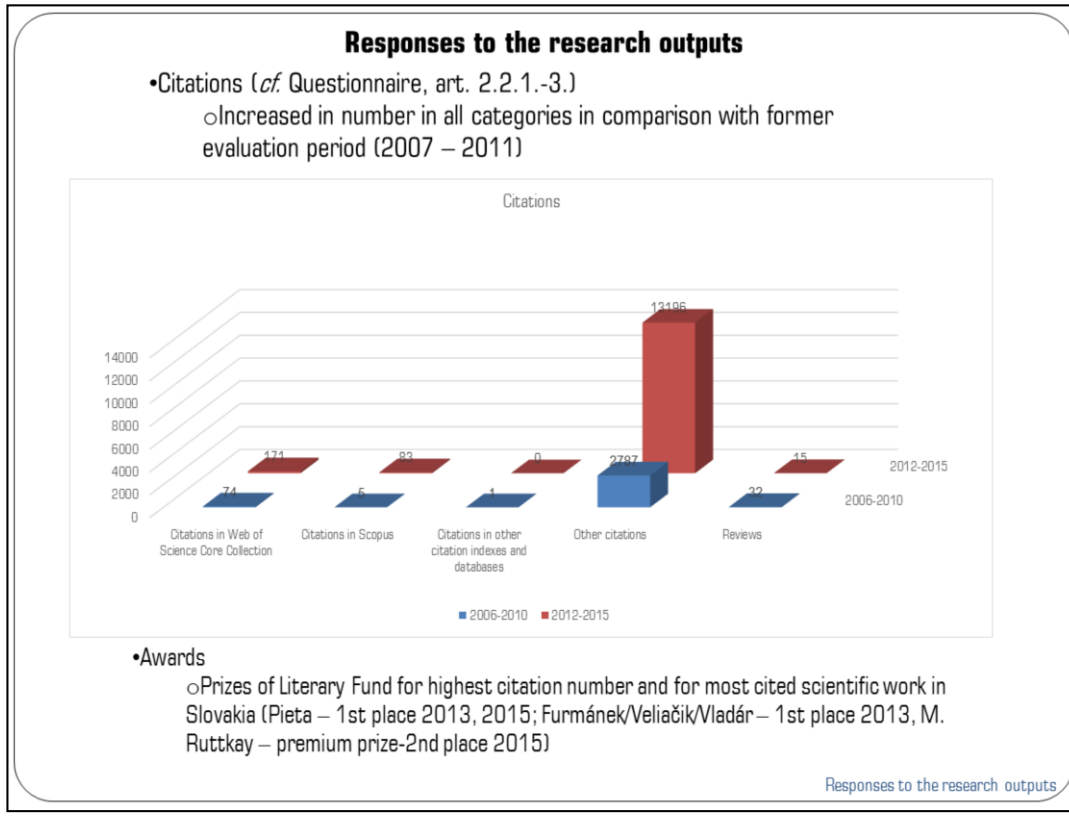
A special emphasis must be put on the foreign monograph Neanderthals at Bojnice in the context of Central Europe and other monographs – The treasures from Žalobín, Prehistoric settlement in Lozorno-Široké diely (West Slovakia), The Arpad dynasty coins from 1000-1301: Their Role in the Development of medieval Slovakia's Economy - Veľká Lomnica - Burchbrich Urzeitliches Dorf unter den Hohen Tatra. Studies on the Carolingian-type strap fittings. 8th-10th century. Part I. II, Desert castle at Zvolen: Lower castle Neolithic and Aeneolithic House Architecture in South-Western Slovakia based on the clay daub analysis. Mužla-Čenkov II = Mužla-Čenkov II. Settlement from 9th-13th centuries. Bükk culture in Slovakia in the light of investigations in Šarišské Michaľany and Zemplínske Kopčany, Strongholds – castles of Western Slavs.

First three (out of 9 planned) volumes of Staré Slovensko publications are important for expert and general public as they will summarize historical development of our territory anew, after more than 80 years.

It is not only a summary of archeology's results in the last decades, it is a new analysis of the whole development and a new view of our past not only from the point of view of material culture but also with the reconstruction of life, social situation, environmental influences, development of the cultural landscape, etc. Setting all processes in at least Central European context is natural.

Monographs from the new VARIA series with a collection of works dealing with the historical development of entire regions are very popular.

Responses to the research outputs



We want to maintain the tendency in the future at all costs. We consider the increased number of responses to published works from 8 360 to 13 196 a great success – it proves that outputs of our investigators are accepted and used in Slovakia as well as in other countries. Although SCC or SCOPUS journals in the field of archaeology do not exist in Slovakia, it is positive that compared to the previous period, the number of WOS citations has doubled. However, it must be mentioned here that most of top European archaeological journals are not included in the WOS or in SCOPUS.

Nevertheless, high number of citations in „other“ journals category show effectivness and usableness of our scientific production for other researchers.

The ambition of the Institute of Archaeology of SAS is to try to succeed in registration of the Slovenská archeológia and Študijné zvesti journals with SCOPUS.

Research status

Research status of the institute

- Significant cooperation with other research institutions in Slovakia:

SAS

1st scientific section

Institute of Materials and Machine Mechanics – object tomography.
Institute of Measurement Science – tomography of small objects.
Earth Science Institute – tomography of large objects, geophysics, magnetometric dating.

2nd scientific section

Institute of Inorganic Chemistry – glass analysis.
Institute of Parasitology – parasites in the past.
Institute of Forest Ecology – consultations on past environment.
Institute of Landscape Ecology – consultations and joined project preparation on landscape use.
Institute of Plant Genetics and Biotechnology – plant protein and DNA research.

3rd scientific section

Institute of History – joined APVV project preparation
Institute of Oriental Studies – joined project preparation on the excavations in Sudan.
Institute of Ethnology – reconstruction of past textile production technologies.
Ľudovít Štúr Institute of Linguistics – joined project preparation on digitalization of cultural heritage.

Research status of the institute

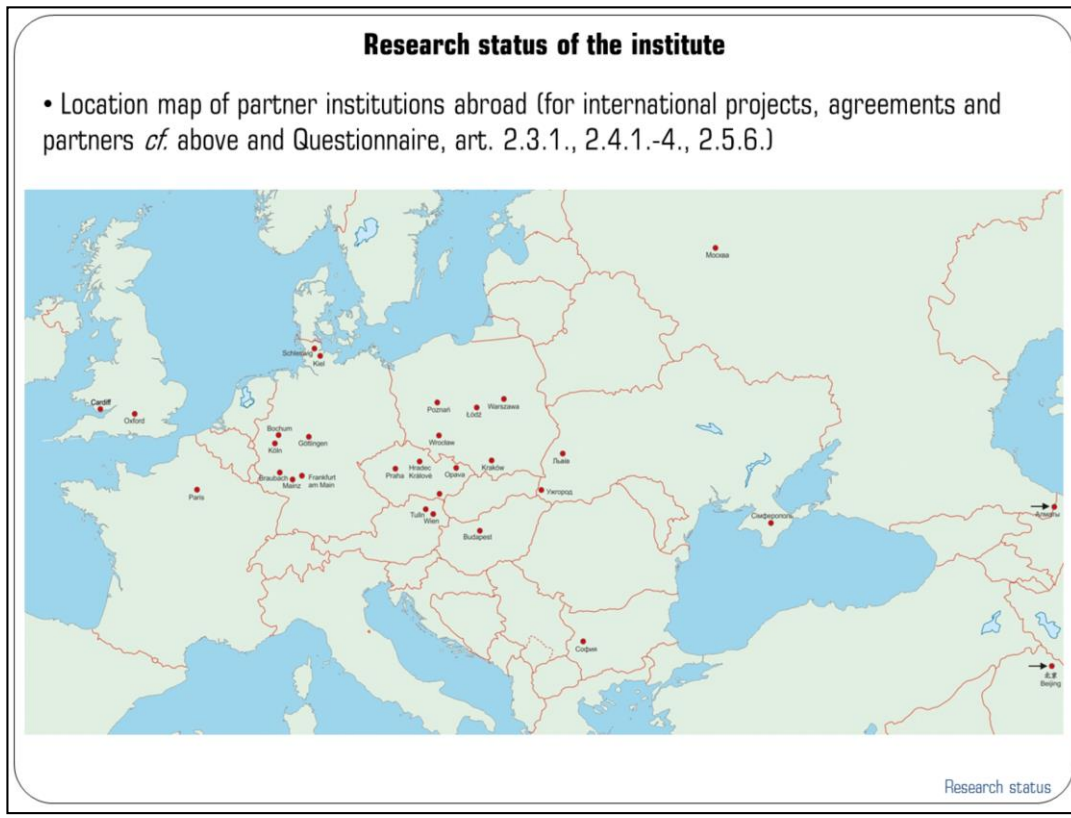
- Significant cooperation with other research institutions in Slovakia:

Universities

Comenius University Bratislava – University (BA, MA, PhD) education, common projects.
Constantine the Philosopher University Nitra – University (BA, MA, PhD) education, common projects.
Matej Bel University Banská Bystrica – archive materials analyses (Maliniak).
Slovak University of Agriculture Nitra – past landscape and food production reconstruction.
Slovak University of Technology Bratislava – past construction reconstructions, static analyses, use of material.

Other resorts

Slovak National Museum – joined APVV project preparation (currently already running).
State Geological Institute of Dionýz Štúr – glass paste analyses.
Welding Research Institute – Industrial Institute of SR – X-rays.
National Forest Centre – consultations, joined project preparation.
Monuments Board of SR – common exhibition projects, conference organizations.



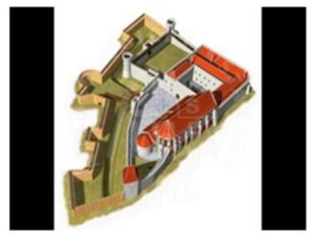
The map presents the cooperating partner institutions within different projects presented already above and partner institutions cooperating on partial research tasks (strontium analyses, C14 anaylses, excavation projects, finds evaluation projects, etc.).

The closest contacts are maintained with academic as well as non-academic institutions in the neighbouring countries, where they solve the same or similar scientific research tasks dealing with protohistorical and medieval development of Central Europe. Besides common partial projects, we have entered basic agreements of cooperation with them. Some of them were prolonged in the monitored period, following specific projects – Institute of Archaeology Czech Academy of Science, Prague; Institute of Archaeology Czech Academy of Science, Brno; Régészeti intézet, MTA Budapest; Univ Budapest; Instytut archeologii PAN Kraków; Römisch-germanische Kommission (RGK) des Deutschen archäologischen Instituts...

Recently, more renowned institutions were added to the list of mutual contacts – Bochum, Moscow, Kazakhstan, Paris, latest Beijing and Kiel.

Research status of the institute

- 25 international projects and collaboration activities (*cf.* Questionnaire, art. 2.1.5., 2.4.2.-3.
  - Field research:
    - ✓Vráble (coop. with RGK Frankfurt and with Bergbau-Musum Bochum)
    - ✓Montane archaeology (central Slovakia, coop. with Bergbau-Musum Bochum)
    - ✓Roman field camps (coop. With RGK Frankfurt)
    - ✓Early Medieval hillforts and Medieval Castles in Slovakia (coop. with Univ. Frankfurt am Main and other inst. in Europe)
    - ✓Etc....



  - Theoretical research:
    - ✓Aimed on current problems of European archaeology, such as absolute dating, strontium and DNA analyses.
    - ✓Significant find collection evaluation (Poprad chieftain tomb).
    - ✓Dating and structure of Early Medieval hillforts in Slovakia.
    - ✓Trans-Carpathian cultural relations during Baden culture.
    - ✓Etc...

Research status

Projects in detail already mentioned above. Here just brief summary of the most important acitivities is shown.

Research on large collection of finds from a princely tomb from the end of the 4th century at Poprad

Parts of tomb equipment as well as clothes and garments of a buried young man were revealed in *in situ* collected blocks when they were put under a surgical microscope in laboratory. Items which are rarely found in other archaeological situations were discovered here in a rather good condition. It is fascinating to see particular leather garment or hat decorations, parts of the robe covering the dead body, a leather bow case, fragments of textiles with golden threads or wooden parts of the tomb's construction, sarcophagus, wooden furniture, bier. Thanks to GIS processing, we can literally trace gradual penetration of ancient tomb robbers (tools show that there were probably four of them) – what tools they used to break the construction, what sort of light they used and how they gradually removed exclusive finds from the underground chamber. Investigation of the tomb is a great example of interdisciplinary cooperation from dating methods through anthropology, zoology, botany, chemistry, DNA, physics, to determining the original colours of textiles or the buried person's background.

Output: A collection of publications and work seminars in 2015. In 2017, installation of a complex exhibition featuring the tomb is planned in the Podtatranské Museum in Poprad. In 2016, we would like to present a selection of finds and reconstructions in one of the political institutions of Slovakia (Parliament, Ministry of Foreign Affairs or Embassy of Germany) as part of the Slovak Presidency of the EU Council.

Archaeological excavation of the settlement and burial ground in Vráble

The investigation focused mainly on uncovering of a burial ground from the Early Bronze Age (2000-1500 BC) which is situated 300-400 m south of the fortified setllement of Fidvár. Most of the burials had been secondarily opened in the past – for ritual purposes or by robberies. However, pottery, bronze ornaments (earrings, pins) and amber beads were found in them. Judging from the size of the burial ground, we can assume that the population of the setttlement in the early Bronze age reached 1,000, which is very unusual for that period. Its proto-urban architecture as well as exceptionally high concentration of population have changed our recent knowledge of the Early Bronze Age in Central Europe (cognition of cultural influences and contacts between the region of Central Europe and distant cultural areas of Eurasia and the Caucasus as well as eastern Mediterranean – Mycenaean culture – in the beginning of 2000s BC).

Archaeological research on prehistoric features Mountainous mining in Špania dolina

Within this project, a vast terrain prospecting of mining works in the territory of the central and upper Hron regions was carried out. The aim of the prospecting was to detect remains of prehistoric mining activities related to copper ore. The emphasis was put on the areas with the largest potential for finding traces of prehistoric mining. It was mainly the area near Ľubietová, Poniky and Špania Dolina. During terrain prospection, a large area was investigated and adits, pinges, dump cones, etc. were thoroughly documented.

New discoveries from medieval castles

The Institute of Archaeology of SAS continued to protect our archaeological cultural heritage by numerous rescue excavations as well as scientific and documentary research. Thanks to grant funds and cooperation with other institutions, we continued to study castles (Bratislava, Čabraď, Divín, Veľký Vrch-Divinka hillfort, Dobrá Niva, Fiľakovo, Gýmeš, Hričov, Kamenica, Košice-Hradová, Lietava, Nitra, Zvolen-Pustý hrad, Vinné, Muráň, Slanec, Modrý Kameň).

The archaeological research of the castle in Nitra belongs to the largest terrain activitiesof the Institute of Archaeology of SAS. In 2012-2015, the archaeological investigation brought new important knowledge. In front of the southern baroque fortification of the castle, a continuation of a masoned Romanesque wall from the turn of the 11th and 12th centuries was discovered. It belongs to the oldest masoned medieval fortifications in Central Europe. This discovery proved our hypothesis of the size of the castle of Nitra in the high Middle Ages (with its area of 8.5 ha, it is the largest castle in Slovakia). Discovery of a part of the ground floor of a long sought Romanesque palace from the 11th-12th centuries under today's palace was very important. Dendrochronological dating of part of the church in the first third of the 10th century plays a significant role in cognition of historical development in Slovakia after the collapse of Great Moravia. Results of archaeological excavations at the Nitra castle have been presented at numerous international events. In 2012, the publication *The Castle of Nitra and the Cathedral Temple – St. Emmeram's Cathedral* was published in cooperation with the Archbishopric in Nitra.

Extraordinary finds have been brought by the investigation of Pustý hrad in Zvolen in 2015, which was carried out in cooperation with the CPhU in Nitra. The royal residential tower of the Lower castle of Pustý hrad is a remarkable monument of supraregional importance, since it was the residence of Hungarian kings, mainly in the 13th century. Pustý hrad itself, with its area of 4.7 ha, ranks among the largest castles in Slovakia. The investigated stone tower at the Lower castle is one of the largest and most important medieval residential buildings in Central Europe (groundplan of 20 x 20 m) and the castle's water tank at the Upper castle is the largest known medieval water receptacle from the territory of Slovakia (groundplan of 7 x 7 m and depth of 10 m). The castle cistern was thoroughly studied in 2015. Besides standard archaeological finds like pottery fragments, animal bones, antlers, iron nails, or a spur, silver denarii from the second half of the 13th century were discovered as well as exceptional finds such as a completely preserved medieval hunting sword with a bone hilt from the 14th century. Water helped to preserve finds of organic origin. We must mention wooden training swords, wooden buckets, fragments of leather and textile items. Remains of more than 700-year-old wooden constructions are very interesting since they are a testimony of craft skills of medieval masters. They also allow us to date the construction of the cistern with a unique technological solution of collecting rain water by means of clay and stone pipes and troughs. In 2013, an extensive monograph was published named *Desert castle at Zvolen: Lower castle* and in 2014, *The Deserted castle in Zvolen and Fortification in Its Surroundings* followed.

In 2015, the Institute of Archaeology of SAS started rescue excavations at the castle in Bratislava. Although a large part of the construction area had been investigated, a very detailed work and documentation in a hard terrain has brought more important results. Relics of unique Celtic-Roman structures from mid 1st cent. BC – the oldest masoned structures in Central Europe – were discovered. Knowledge of previously uncovered features was also specified. It helped us get a more complex picture of the design and operation of this exclusive construction complex on the bank of the Danube river. Detection of medieval castle architectures – remains of a castle standing on the hill before extensive reconstruction, i. e. new construction organized by Hungarian king and later Roman Emperor Sigismund of Luxemburg (1368-1437) – was surprising.

Investigations have brought fundamental results in the study of the historical development of these castles as well as of life there and in their surroundings. The new information was immediately used in projects for restoration of the castles. The results from the castle of Lietava were awarded the prestigeous price of the Monument of the Year. The archaeological investigation in Košice- Hradová site contributed to the successful restoration of the area and quality preparation of the European Cultural Capital project in 2013. As part of work on the topic of castles, experts from the Institute of Archaeology took part in several international conferences.

Dating and structure of Early Medieval hill forts in Slovakia

It was an extensive project in cooperation with the Goethe University in Frakfurt in 2004-

2013. Within the project, fortifications on the sites of Majcichov, Pobedim, Nitrianska Blatnica, Bíňa, Zemplín and Bojná were studied. Researches and geophysical measurings were carried out on these sites. On the basis of the results of these activities, areas suitable for archaeological investigation were detected. The research focused on detection of construction elements of fortification and on exact dating. The project included collecting C14 samples, dendrochronological samples and samples for micromorphology. Numerous interdisciplinary analyses have brought fundamental progress in dating of the early Middle Ages in Slovakia and Central Europe.

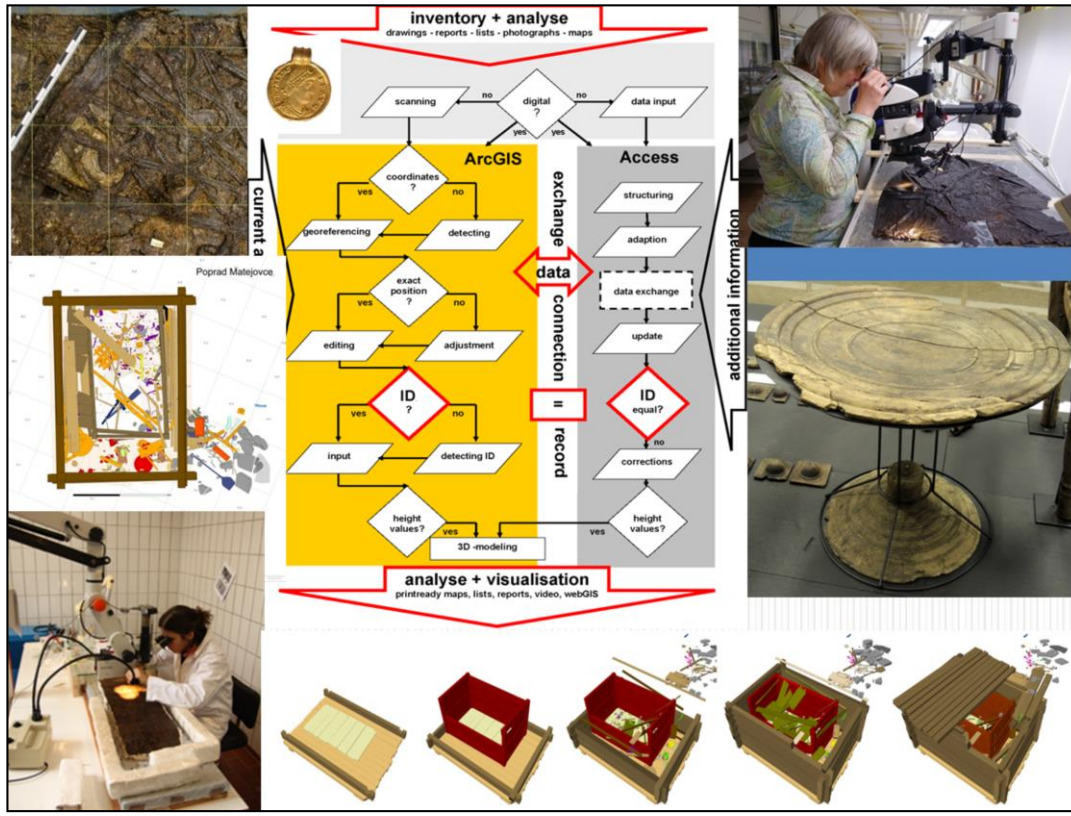
New methods of investigation of archaeological sites

Thanks to projects from structural funds, extensive aerial scanning (LIDAR technology) of selected areas of Slovakia was provided for the first time. The areas included Považský Inovec, Tribeč, Strážovské vrchy (Strážov hills) and Pohronský Inovec. In a result, unique 3D images of the terrain in high definition were obtained. They profide fantastic documentation of known sites and at the same time, a high number of unknown fortifications, tumuli, extinct routes, fishponds, mining areas and other features stood out. It immediately enabled us to target new investigations more effectively. The greatest progress was made in discovering new fortified areas near the well-known hillfort of Bojná. A new extremely rich prehistoric and Great Moravian hillforts in Strážovské vrchy (we do not state the site on purpose) as well as tumuli and hillforts in the Tribeč hills were thoroughly documented. 3D data will be further analyzed and in 2016, we plan to scan other areas.

Outputs: 3D models used for exhibitions and presentations; publications and studies.

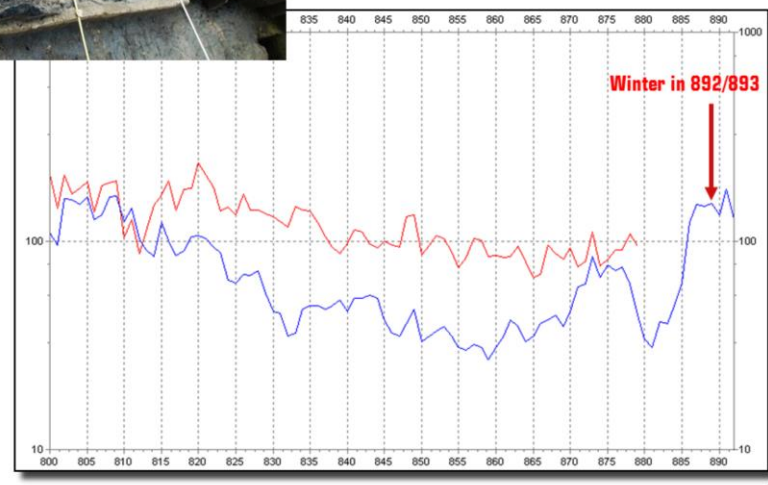
New methods of investigation of archaeological finds – strontium analyses

In 2015, first results of a project focused on monitoring migration of archaeologically documented populations were obtained. The method is based on the fact that strontium occurs in four stabile isotopes and nuclide of strontium 87Sr is created in time by decay of radioactive rubidium 87Rb. From the substrate, strontium gets into plants or water and as food, it gets into bodies of animals where it accumulates while they grow. Thus, if a change in the content of isotopes in the buried body and its surroundings is detected (teeth are the best sample), it is clear that the individual did not grow up in the given environment. Thanks to the cooperation with BOKU university in Tulln (where they monitor migrations of animals or origin of fruit and vegetables on the European market on the basis of this method), first all geological bedrocks of the upper Žitava region, plants and streams were sampled and later, samples from the burial grounds in the residential area of Tesárske Mlyňany were analyzed. It was discovered that the community burying in the area in the Great Migration Period had not arrived from distant territories, as it had been supposed on the basis of archaeological finds. Further employment of this method can significantly change our current views of the migration trends in the past.



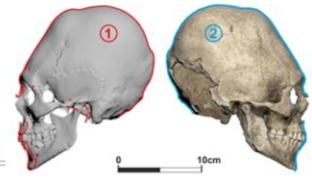
Insight into Poprad chieftain tomb finds research project.

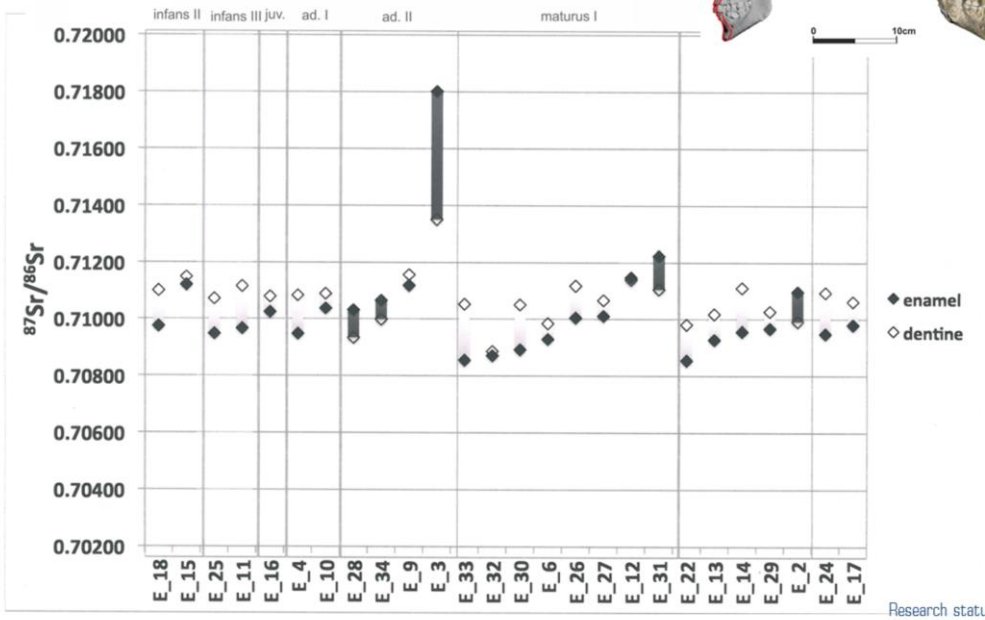
•Aimed absolute dating of Early Medieval hillforts enabled changes of up-to-date used chronology of Early Medieval period that consequently led to changes of paradigms in the European research of this topic.



Research status

•Monitoring migrations of archaeologically recorded populations
  ○Isotope analyses – $^{87}Sr/^{86}Sr$ und $\delta\,^{87}Sr/^{86}Sr_{SRM987}$





Research status

In course of its almost 80-year-long existence, the Institute of Archaeology gradually became a respected scientific institution with a very good reputation. In the domestic environment, it is reflected in its predominant position in the field of basic as well as applied research and in its quality.

Its national position is reflected in its collaborators' participation in various distinguished scientific boards and committees. Currently, it has four representatives, including the president, in the Archaeological Board at the Ministry of Culture of SR, one member of the Monuments Board at the Ministry of Culture of SR, a member of the National Consulting Panel Cultural Heritage in the Context of Global Changes at the Ministry of Education, Science, Research and Sport of SR.

As ordered by Act 49/2002, the Institute administers and manages the Central Evidence of Archaeological Sites of Slovakia, which is fundamental for taking decisions in building projects procedures and also for scientific activities in the field of spatial archaeology.

Our representation in scientific boards of distinguished universities is remarkable – Scietific Board of Commenius University in Bratislava, Scietific Board of Constantine the Philosopher University in Nitra, SB of Faculty of Arts of Constantine the Philosopher University in Nitra, Scietific Board of Faculty of Arts of Commenius University in Bratislava, Scietific Board of Faculty of Arts of of Trnava University in Trnava, Scietific

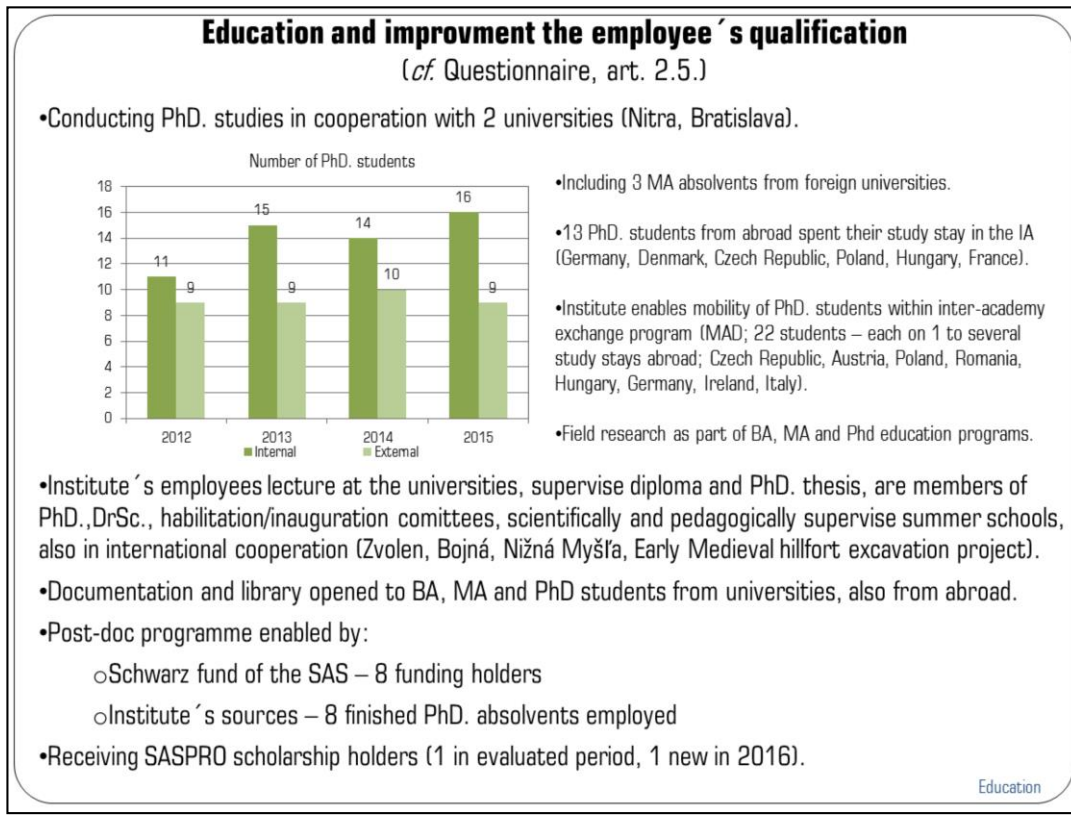
Board of the Slovak Historical Institute in Rome.

Besides membership in various grant schemes, our employee is currently the President of the Council for the Humanities at APVV (main national grant agency) and another one is the President of the Council for Historical Sciences VEGA (grant agency). Collaborators of the Institute are regularly invited as arbiters in expert and public discussions regarding history, archaeology and protection of cultural heritage. In cooperation with two universities, the Institute provides doctoral studies in the field of archaeology. Many of our researchers teach at the universities home and abroad. We are also members of editorial boards of the most respected Slovak and foreign periodicals.

International status of the Institution highlights the number of foreign scientists who visited Archaeological Institute between 2012 and2015. For the purpose of studying the Institution attended by a total of 250 scientists from different Archaeological Institutions of Europe.

Engagement of collaboratorsof the Institute of Archaeology SAS in Slovakia and abroad is visible in the number of national as well as international awards.

Scientific education



Participation of the Institute's employees in the educational process at universities is stable (Brno, Bratislava, Nitra). Six investigators guaranteed or co-guaranteed study programmes at universities (Nitra, Bratislava).

Institute has successfully managed the transformation to the new form of doctoral study and there are first graduates already. Due to the change in legislation (concluding "old" doctoral studies in 2010 and the beginning of the new system caused a lag in doctoral studies in 2013 and the gradual increase in the number of studying and graduated PhD students).

Within the competitive international environment, the Institute aims to accept the best students and not only its own. Thus, graduates from Budapest, Krakow, Brno or Moscow have become part of scientific teams either temporarily or permanently. Receiving two scholarship students within SASPRO programme was a very positive signal. As part of post-doctoral supporting schemes, we are regularly awarded posts in the Schwarz Fund programme. Great attention was paid to generational continuity. PhD students or post-doctoral students received several long-term stays at foreign universities and scientific workplaces and many respected awards.

The Institute as a training workplace for PhD students considers external doctoral studies an important form of education, since mainly practice creates the criteria for selection of the best applicants for everyday pace of scientific work. The fact that these students,

despite studying mostly at IA SAS, must pay high fees to the respective university is a great flaw.

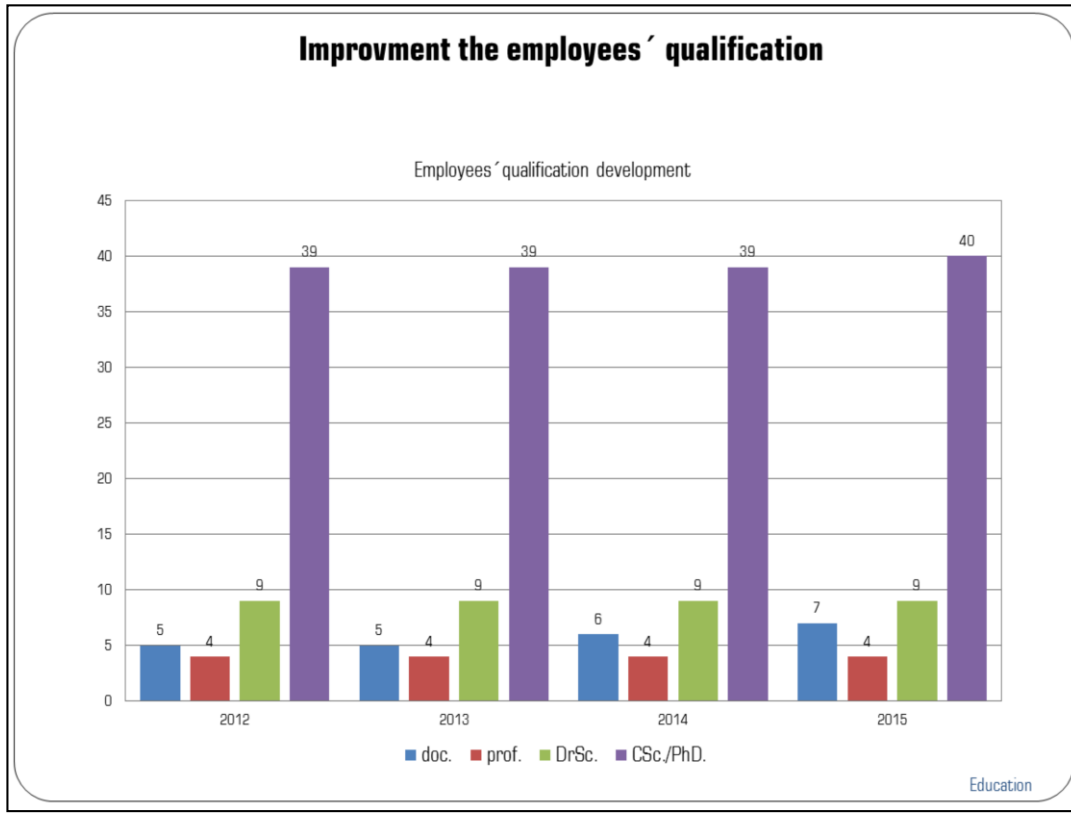
To achieve higher quality in this activity, the Institute of Archaeology organizes at least one two-day colloquium per semester focused on inspection of activities of the internal and external PhD students. The colloquiums include lectures of advisers targeted at solving methodological and expert problems. Internal defences, preceeding the official defence process, intend to eliminate possible faults of doctoral theses before they are definitely submitted and contribute to a better quality of the theses. PhD students are also educated in the field of methodology and technique of terrain research and in possibilities of interdisciplinary cooperation.

The Institute of Archaeology of SAS increases the level of PhD students' education by means of provided language courses and trainings necessary for use of the latest documentation software and equipment so that the students can use the specialized technology and other laboratory equipment in their work.

All PhD students are part of research project teams and various types of grant projects. Results of their investigations are presented in preliminary outputs at national as well as international scientific events and in publications. The best published outputs are annually awarded in the Competition of young creative workers which is part of the celebration on the Days of Anton Točík in the mother institution. To enrich contacts between PhD students and renowned institutions abroad, there are research fellowships within MAD (International Academic Agreement) and others which are supported from the current grant projects.

The Institute of Archaeology is also a training institution in the field of terrain practice also for students from other university workplaces, too. Students of archaeology participate in field research, improve their documentation skills and become familiar with the procedure of processing of find funds. Besides terrain research, the Institute of Archaeology, as the administrator of the largest collection of archaeological finds in Slovakia, also provides study material which is processed and published in semestral, bachelor, diploma and disertation theses. In the reporting period studied material in the depository of the Archaeological Institute of 38 students from universities: Constantine the Philosopher University Nitra (SK), Comenius University Bratislava (SK), University in Trnava (SK), Masaryk University Brno (CZ), Palacky University Olomouc (CZ).

Every year, the Institute of Archaeology of SAS organizes summer schools of archaeology for domestic and foreign students of archaeology and related scientific disciplines. During the courses, students learn about the latest methods, equipment and techniques used at systematic terrain researches.



Besides the professional growth (often accompanied by existential problems) of young experts and PhD students, the level of qualifications of scientists has increased remarkably. Along with several promotions to the category of independent scientific workers (IIa), two habilitations took place in the monitored period and some more are prepared. The number of doc./IIa employees remains balanced despite, but also thank to the gradual generation exchange in the Institute.

Social impact

Social impact

(*cf.* Questionnaire, art. 2.6.)

- Scientific library:
  - By the end of 2015 it contained 84 474 publication units.
  - In 2012 – 2015 almost 7000 visitors, over 8000 borrowings.

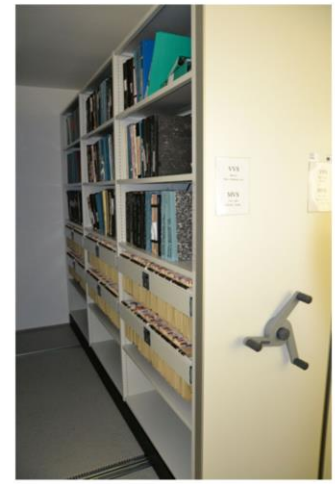
- Central evidence of archaeological sites in Slovakia – management and administration, lending site documentation (for scientific purposes, for state and regional governing institutions). Currently it contains:
  - 28 837 records about archaeological activities (since 1939);
  - 24 934 field reports (since 1951);
  - 418 667 photographs (field + objects/analogue + digital + slides).

- Management and administration of extensive depositories in Malé Vozokany and Nitra "Martinský vrch":
  - Providing material for study and scientific purposes for researchers and students (BA, MA and PHD thesis): in reported period 38 students accessed the Institute´s study collections (SK, CZ).
  - Providing material for presentation purposes.

- Expert opinions: 1869 expert opinions for government, NGOs, international/foreign organizations.

- Rescue excavations.

- Social discourses: regarding protection of archaeological monuments, construction activities, latest scientific results for public.



Social impact

Social impact/Popularization of science

Social impact and popularization of science

(*cf.* Questionnaire, art. 2.6.-7.)

•(Co-)organization of national and international exhibitions – most significant in evaluation period was exhibition in Vatican museums *Saints Cyril and Methodius...* (2013/2014) and exhibition of part of finds from Poprad chieftain tomb.

Map of cities with exhibitions organized or finds lent for exhibitions by the SAS IA.

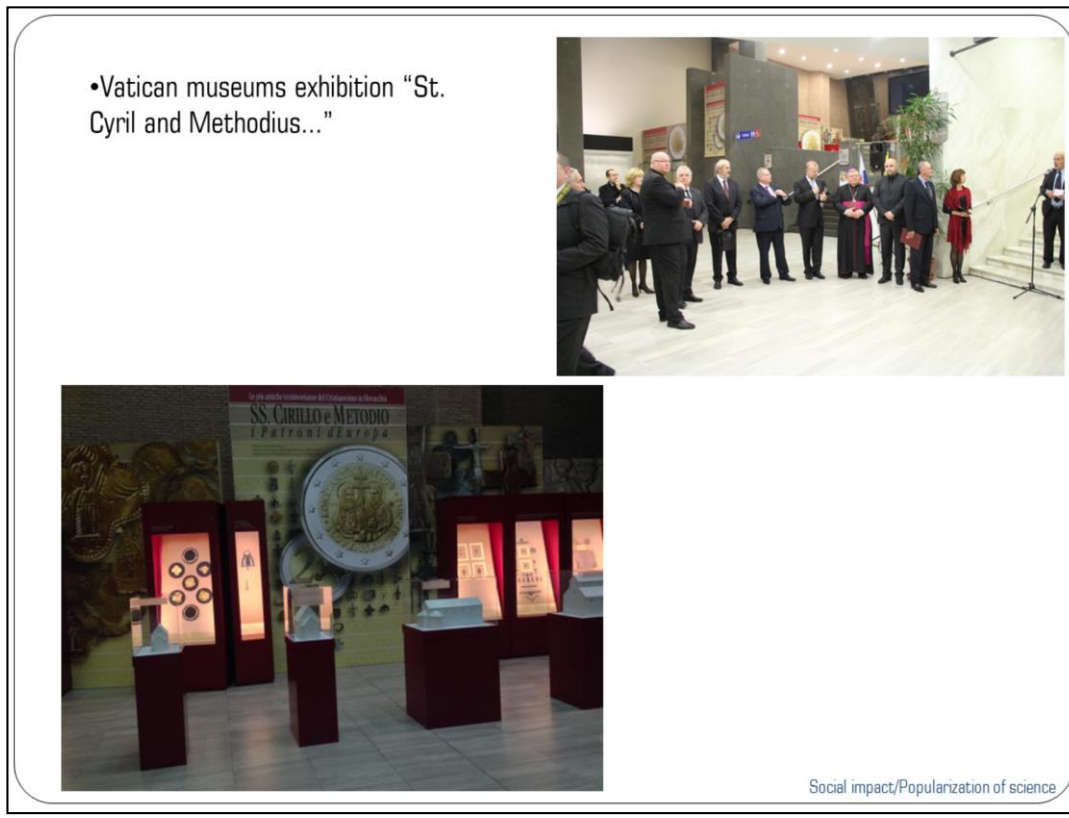
Social impact/Popularization of science

Some social impact events and popularization events are mutually closely related therefore they are referred to in both article 2.6 and 2.7. of Questionnaire.

In 2012 – 2015 IA had 842 popularization outputs and 86 outputs in form of exhibitions and presentations.

Types of popularization outputs: Presentation in media; Lectures; Open day at the Institute of Archaeology of SAS in Nitra; Science café and sweet shop; The Researchers' Night; Summer school of archaeology; The festival of Cyril and Methodius in Bojná; Organizing various events for public (e.g. Days of the Citizens of Nitra); Cooperation with societies and centres for leisure time activities; Excursions for public; Building archaeo-parks for public; Competition of Quark magazine; Exhibitions.

Exhibitions. Every year, the Institute of Archaeology participates in numerous exhibitions in Slovakia and abroad. In 2012 – 10 exhibitions; 2013 – 21 exhibitions; 2014 – 17 exhibitions; 2015 – 12 exhibitions were organized, i.e. 60 exhibitions in total.



Exhibitions. Every year, the Institute of Archaeology participates in numerous exhibitions in Slovakia and abroad. In 2012 – 10 exhibitions; 2013 – 21 exhibitions; 2014 – 17 exhibitions; 2015 – 12 exhibitions were organized, i.e. 60 exhibitions in total.

Title of exhibition: **Saint Cyril and Methodius – Patrons Saints of Europe**

Place: Vatican

Date: 12 November 2013 – February 2014

Evaluation: The exhibition presents the oldest evidence of the beginnings of Christianity in Slovakia. It is organized under the patronage of the Slovak Republic's Prime Minister Róbert Fico and the diocesan bishop of Nitra Mons. Viliam Judák who personally vistied the exhibition's opening on the ground of the Vatican Museums. The Slovak National Museum in Bratislava and the Institute of Archaeology of SAS in Nitra, in cooperation with the Embassy of the Slovak Republic at the Apostolic See, are the main organizers of the exhibition held on the occasion of the 1150th anniversary of Cyril and Methodius's arrival in the territory of Great Moravia. The exhibition *Saint Cyril and Methodius – Patron Saints of Europe* was installed in the entrance part of the Vatican Museums and was open to the public until 26 January 2014 (PhDr. Ruttkay, M., CSc.)

Title of exhibition: **The Prince Tomb from Poprad. Conservation 2008-2012**

Place: Podtatranské Museum in Poprad

Date: 17 July 2013 – November 2014

Evaluation: Exhibition was organized in cooperation with Stiftung – Holsteinische Landesmuseen, Schloß Gottorf, Schleswig and Podtatranské Museum in Poprad (Pieta, K., Štolcová, T.).

The permanent exhibition on the find will be installed in 2017/2018.

Other exhibitions

Title of exhibition: **Open the Gates of Paradise. The Benedictines in the Heart of Europe 800-1300**

Place: The National Gallery in Prague

Date: 6 November 2014 – 15 March 2015

Evaluation: Cooperation at the exhibition (lent finds). The Order of Benedictines became an important social element in the Early Middle Ages. It is an exhibition where unique artifacts and written documents appeared (Blažová, E., Samuel, M., Ruttkay, M.).

Title of exhibition: **Mycenae and Central Europe. The Beginnings of European Civilizations in the Bronze Age.**

Place: Moravian Museum in Brno – Anthropos Pavilion

Date: 15 October 2014 – 16 August 2015

Evaluation: Cooperation at the exhibition (lent finds, Blažová, E., Olexa, L.). It is an international exhibition targeted at the Early Bronze Age.

Title of exhibition: **From Alexander to Tamerlane. Military Campaigns on the Silk Road.**

Place: Ostravské muzeum in Ostrava

Date: 18 December 2014 – 28 February 2015

Evaluation: Cooperation at the exhibition (lent finds). The exhibition deals with the topic of complex history of the Silk Road on the background of military events (Blažová, E., Ruttkayová, J., Ruttkay, M.).

Title of exhibition: **Great Moravia and the Beginnin of Christianity**

Place: 28 November 2014 – 28. February 2015 Brno – Palace of Noble Ladies, Moravian Museum Brno; 17 April – 28 Jun 2015 Prague – Imperial Stables, Prague Castel; 7 August – 1 November 2015 - Bratislava Castle, Bratislava

Date: 2015

Evaluation: The international travelling exhibition *Great Moravia and the Beginnings of Christianity* was first opened in Brno in 2014, then it stopped in Prague and finally, it was presented in the Slovak National Museum – The Museum of History in Bratislava. Visitors could have seen almost 1,400 precious archaeological finds borrowed from 20 institutions from the Czech Republic, Moravia, Slovakia, Austria and Poland. The Institute of Archaeology of CAS in Brno was the chief organizer. The Institute of Archaeology of SAS provided most of the presented finds from the territory of Slovakia.

Title of exhibition: **Barbarian Graves at Prague-Zličín. The World of the Alive and the Dead in the Great Migration Period.**

Place: The City of Prague Museum

Date: 27 May 2015 – 14 February 2016

Evaluation: The Institute of Archaeology lent exhibits, created captions and the catalgue part of the lent finds (K. Pieta).

Social impact and popularization of science

(*cf.* Questionnaire, art. 2.6.-7.)

•(Co-)foundation of local museums (Bojná, Nižná Myšľa, Púchov) and scientific supervision of their performance (Bojná, Liptovská Mara, Nižná Myšľa, Púchov).

Bojná

Nižná Myšľa

Social impact and popularization of science

(*cf.* Questionnaire, art. 2.6.-7.)

•Experiment and reconstruction in archaeology (archaeoparks Nitra, Bojná, Štrba-Šoldov, Liptovská Mara).

Social impact/Popularization of science

ARCHEOPARK NITRA

Garanti projektu:

MESTO NITRA

RÍMSKOKATOLÍCKA CIRKEV – BISKUPSTVO NITRA

ARCHEOLOGICKÝ ÚSTAV SLOVENSKEJ AKADÉMIE VIED

ZÁKLADNÝ KAMEŇ POLOŽENÝ 3. JÚLA 2015

Nitra

Social impact/Popularization of science

Social impact and popularization of science

(*cf.* Questionnaire, art. 2.6.-7.)

•Experiment and reconstruction in archaeology (archaeoparks Nitra, Bojná, Štrba-Šoldov, Liptovská Mara)

Liptovská Mara

Social impact and popularization of science

(*cf.* Questionnaire, art. 2.6.-7.)

•Publishing popular science monographs.

•Archaeological investigations of Medieval castles and Monasteries within the project of Ministry of Culture.

Social impact and popularization of science

(*cf.* Questionnaire, art. 2.6.-7.)

•Workshops, children university, primary and secondary school lecturing, European researcher´s night and Week of Science and Technology actions, European Cultural Route of Saints Cyril and Methodius, etc.

Social impact/Popularization of science

http://www.cyril-methodius.eu/

Background and management

Institute´s personnel policy

- Equal personal representation of individual research specializations within archaeology.
- Employing researchers of other disciplines – antropology, archaeozoology, archaeobotany, muzeology, geology, gemology, numismatic etc.
- Improving qualification and effectiveness of institution employees on each level (expert, service and technical personnel).
- Testing increased number of young researchers within their doctoral studies, or within rescue excavations.
- Using the possibility to include absolvents of Bachelor university degree in research process or as service employees (documentation, conservation, etc).

Personnel	2012	2013	2014	2015
All personnel	139,0	137,0	132,0	135,0
Research employees from Tab. Research staff	60,0	60,0	62,0	60,0
FTE from Tab. Research staff	48,940	53,950	51,710	54,130
Average age of research employees with university degree	49,5	48,9	48,8	49,7

	2012		2013		2014		2015		total		
	number	FTE	number	FTE	number	FTE	number	FTE	number	averaged number per year	averaged FTE
Number of employees with university degrees	60,0	48,940	60,0	53,950	62,0	51,710	60,0	54,130	242,0	60,5	52,183
Number of PhD students	14,0	8,990	18,0	12,320	22,0	13,370	21,0	13,710	75,0	18,8	12,098
Total number	74,0	57,930	78,0	66,270	84,0	65,080	81,0	67,840	317,0	79,3	64,280

In 2012-2013 the number of employees increased thanks to EU SF financing.

A modern state-of-the-art workplace created and developed within EU SF and other projects and/or through external financing

In the evaluated period, the IA of SAS succeeded in taking an important step in increasing the quality, literally making a revolutionary change, in the scientific infrastructure. The stated change was made thanks to the extreme effort of several workers. The most important equipment was obtained in 2014 and 2015, thus, the effects of the change will be fully visible in the following evaluation period.

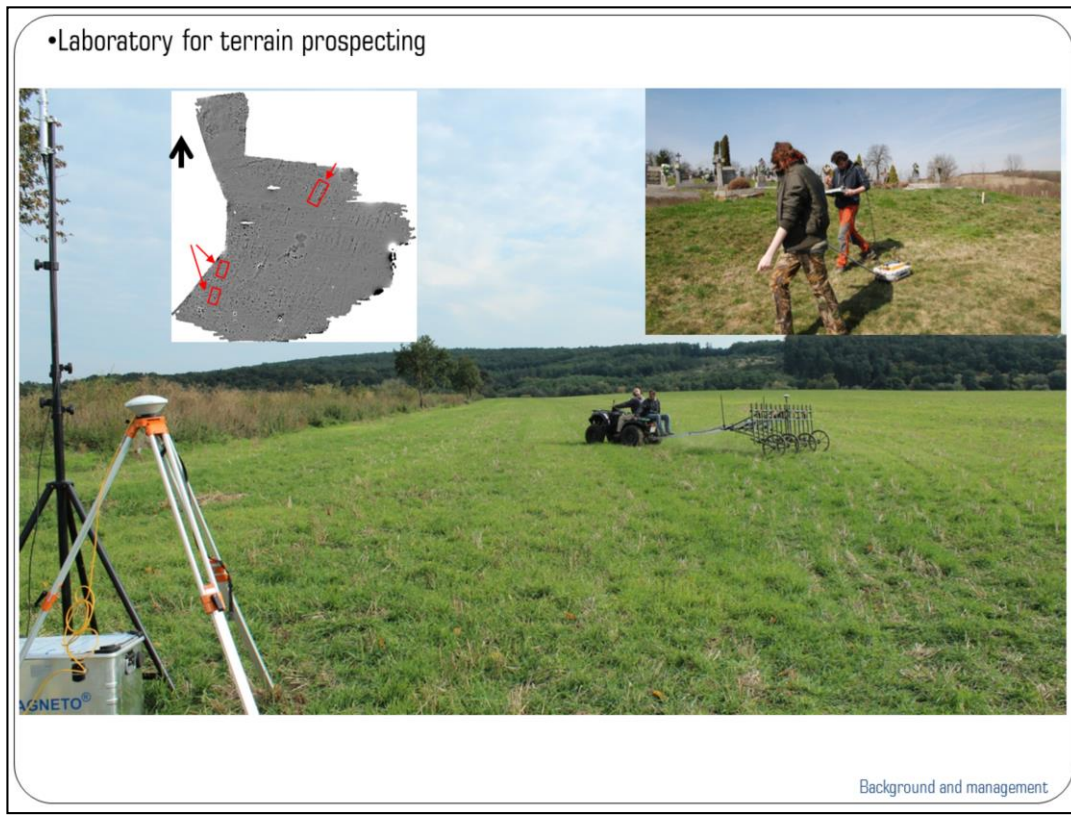
The new devices will be used mainly to solve the projects within which they have been obtained (within the sustainability period). Now, they are used to solve other scientific research tasks – institutional, inter-institutional and transnational. Naturally, they are part of other suggested projects with participation of several institutions – e. g. the newly submitted projects of the structural funds – Constantine the Philosopher University, Slovak University of Agriculture, the Institute of Landscape Ecology of SAS, AGROCONS Banská Bystrica; another project Support of strategical research focused on biodiversity and adaptation to unfavourable effects of climate change, Slovak University of Agriculture, Technical University in Zvolen, ProPopulo Poprad s. r. o., Chateau Topoľčianky Vineyards and Winery s. r. o., Agrokarpaty s. r. o. Plavnica. Of course, they will be used in most of the internal investigative projects (VEGA, APVV) and to preserve and restore finds.

The equipment is used also in other projects where the Institute is a co-solver. They include international projects – terrain as well as theoretical – e. g. international researches related to the Stone and Bronze ages in Vráble, Roman marching camps, early medieval centres of power, etc.

A modern state-of-the-art workplace (Centre) for scientific documentation (incl. field documentation) was created – with servers, new information system, evidence of investigation reports and activities since 1939, depository of so-called small finds, geodesy, etc. In the second building with legth of more than 80 m and area of 1200 m^2, a modern **depository** for pottery finds was built. It is equipped with modern compression shelves, refrigerators, freezing containers and working tables for analyses of finds.
A unique space was created there enabling the Institute to fulfill the tasks which follow directly from Act no. 49/2002 on protection of the monuments fund and also creates excellent conditions for scientific investigation. Continuous digitization of funds and and sites creation of two interconnected information systems (archaeological sites and archaeological finds) gradually opens opportunities of remote access to uniqe data.

The Institute has managed to catch up with the trend of modern archaeology and thanks to SF EU it obtained state-of-the-art equipment for modern 3D documentation of objects from finds through find situations to standing architectures. Effectiveness of these activities is supported by highly qualified and expert personnel.

ISAU system for site registering and documentation of archaeological activities including complete documentation (photodocumentation, plans, registration lists, measurements...); MUSEION system for finds registering and storing including finds expert description, restoration and depository agenda. Both systems have possibilities of data filtration what facilitates their usability. The main phase of new systems´ implementation have been carried out in 2014 – 2015.



Largest geophysically surveyed areas in Central Europe, top equipped laboratory on European level.

Laboratory for terrain prospecting

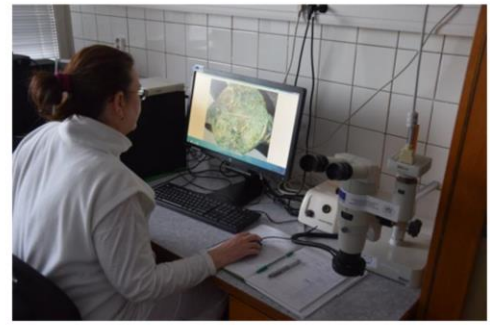
The laboratory belongs to the longest working laboratories in the Institute and is one of the most experienced laboratories in the EU. Currently, it includes a large scale of prospecting methods including 3D data. It was there where systematic aerial and geophysical survey using LIDARs was introduced first in the EU. Today, the laboratory uses a system of georadars, magnetometers, 3D scanners, metal detectors, an octocopter, etc. (RTK GNSS rover system GPS – Leica CS 08, 3D scanner – terrain Faro; total stations; georadar X3M Sysem Kit 1). This enables us to identify extinct archaeological features, river side channels, mining features, etc.

The list of unique equipment/functional units with unit purchase price higher than 150,000 EUR (exclusive of VAT) which are part of the laboratory: LEICA C10 with accessories and software; magnetometer SENSYS – Mxcompact Data Acquisition Electronics with accessories.

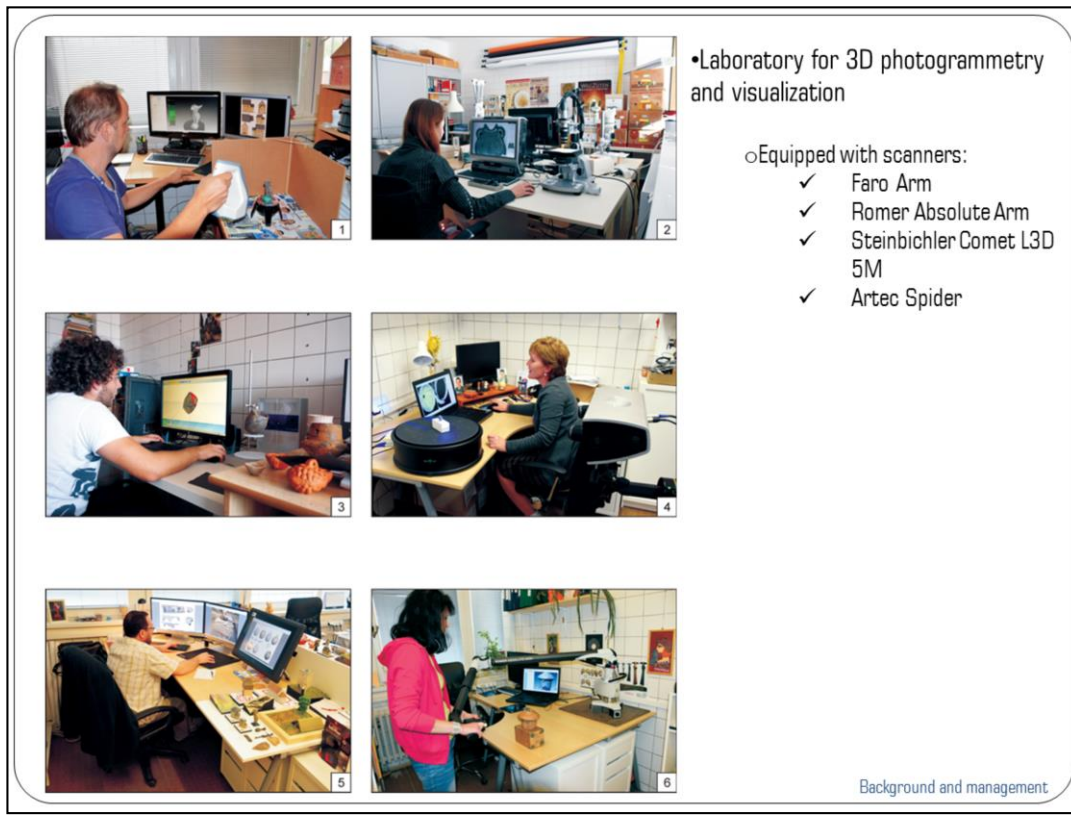
•Laboratory for terrain prospecting

- Restoration laboratory



Background and management



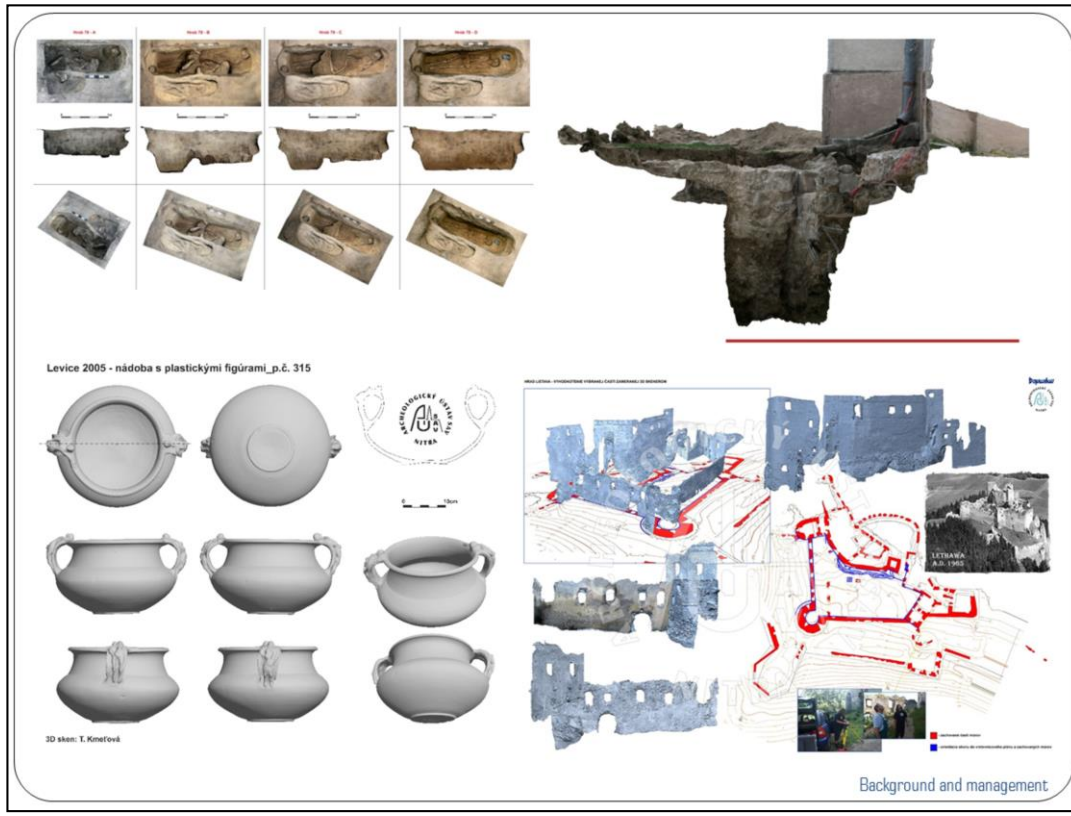
Laboratory for documentation and analyses

The laboratory is designed to provide sophisticated analysis of archaeological samples, ecofacts and finds. Thanks to the modern equipment, analyses can be carried out in the laboratory itself – in the past, it was necessary to order analyses from abroad. Moreover, the analyses are done immediately, without delays, which is essential for sensitive archaeological finds (often organic or soil sediments). Highly efficient equipment (SRF spectrometers Niton XL3t980 GOLDD+ with accessories; Keyence VHX-700F and other accesories; NIKON SMZ-800 with accessories, etc.) in the hands of our investigators and scientific technical workers have made the interdiscipinary processing of archaeological investigations highly effective. On the basis of XRF analysis in soil sediments, they can e. g. identify traces of ancient metallurgy, etc.

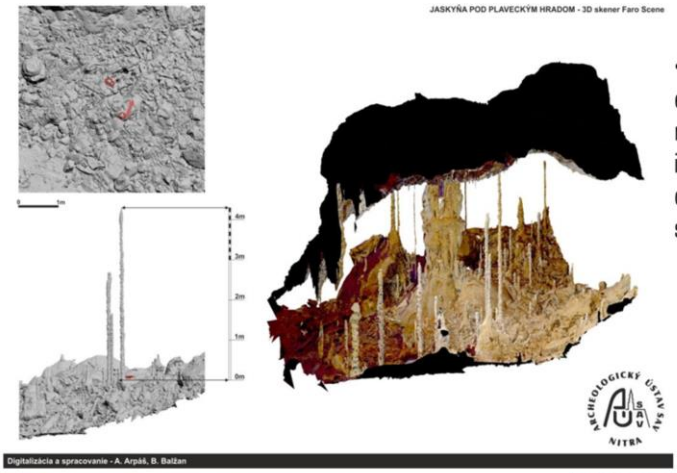
Laboratory for 3D photogrammetry and visualization

The laboratory focuses on photogrammetric processing of feature and find photographs and their transfer to 3D environment – point cloud. It makes it possible to preserve the digital shape of photographed features and finds. It includes a photogrametry studio for documenting archaeological artifacts with accessories and software; Data centre with software (Firewall with integrated application control) and network infrastructure (server, powerful service cables for reliable and safe access). The laboratory focuses also on modern and highly precise documentation of archaeological cultural heritage in several segments – small finds, ecofacts, standing architectures, archaeological sites. Today, the laboratory or the system of laboratories belong to the most effecive laboratories in Europe. Besides documentation itself, new technological procedures in three-

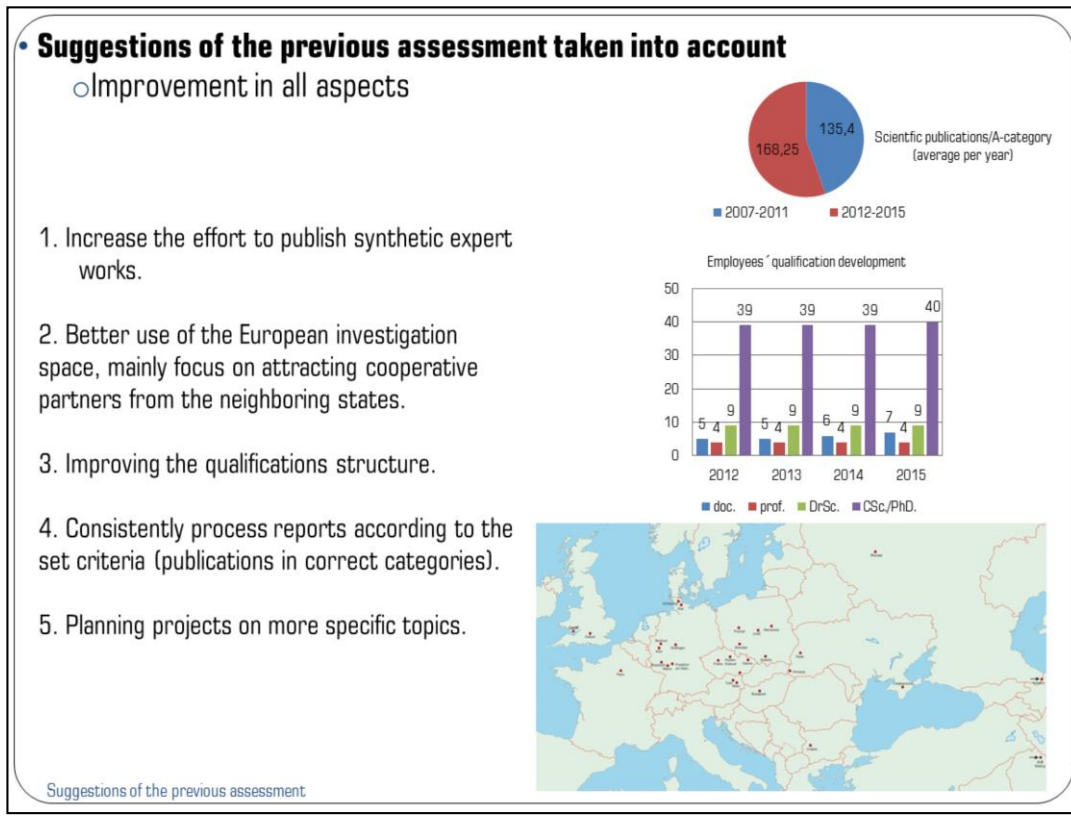
dimensional documentation are being developed there. A series of scanners connected to several working staions and skilled scientific personnel can specify access to individual finds regardless of their size. Not only are the results a base for detailed analysis, they can be used to visualize individual segments. As for the equipment, we can mention e. g. 3D optical scanner Comet L3D with accessories, 3D printers/software.



3D scanning of standing structures, underground features uncovered during excavations and obtained finds.



•First cooperations successfully established, making use of the modern equipment and infrastucture (e.g. scanning cave interiors for the needs of speleology).



Description of how the results and suggestions of the previous assessment were taken into account

In its scientific investigation, the Institute makes an effort to take the recommendations of the last Accreditation Commission into account to their full extent.

1. Increase the effort to publish synthetic expert works:

In the evaluated period, we observe an increased number of monographs and remarkably higher number of synthetic works. Annual increase are 32,85 publication outputs. Synthetic works were published on particular historical period (e.g. Palaeolithics, Bronze Age) or particular topis (e.g. Neolithic/Eneolothic house architecture, Bronze Age cemeteries, Slavic hillforts, etc.).

2. Better use of the European investigation space, manily focus on attracting cooperative partners from the neighbouring states:

Although we are convinced that we had achieved excellent results in this part in the past, the increased number of contracts of cooperation in scientific investigation as well as the number of projects with the neighbouring countries can be documented.

On the other hand, the cooperation with more distant countries (Bulgaria, Germany, Great Britain, France, Russia, Kuwait, China) has been developing successfully. Institute has contact with all important European institutions through publication exchange, as well as through conference, workshop and exhibition organisation.

3. Improving the qualifications structure

In the monitored period, we managed to provide a higher number of scientific workers, increase the number of habilitations , and keep the number independent scientific promotions to category IIa – independent scientific worker (equal final number of employees of subjected category, already after generation exchange, however). One DrSc procedure was successfully finished in spring 2016 and two more DrSc. theses are prepared to be submitted. In total, the Institute has one of the highest numbers of DrSc titles among the institutes of social sciences and humanities in SR.

4. Consistently process reports according to the set criteria (publications in correct categories)

Classification of publication outputs is subject to multiple inspection (ending with the Central Library of SAS), thus, publications should not be wrongly classified (there are no particular examples from the recent period or the Institute classified some outputs in lower categories).

5. Planning projects on more specific topics

We are convinced that the Institute submits enough projects on narrower (more specific) topics which is documented by the relatively high number of our successful applications with all types of grant agencies.

Present state of the art – summary

Present state of the art

(*cf.* Questionnaire, art. 3.1.)

- Institute as top scientific institution with great reputation in Slovakia and abroad.
- Engagement in the field of basic research.
- Administration and management of CEANS.
- Leading position in creating new methods of investigation and use of interdisciplinary approaches.
- Providing PhD education in the field of archaeology, participates on lower degrees of university education.
- Institute´s representatives active in all important panels related to cultural heritage as well as in organization committees and edition boards abroad-
- International cooperation in field and in theoretical research.
- Scientific outputs predominantly in the form of publications and conferences.
- Diverse social, cultural and economic impact.

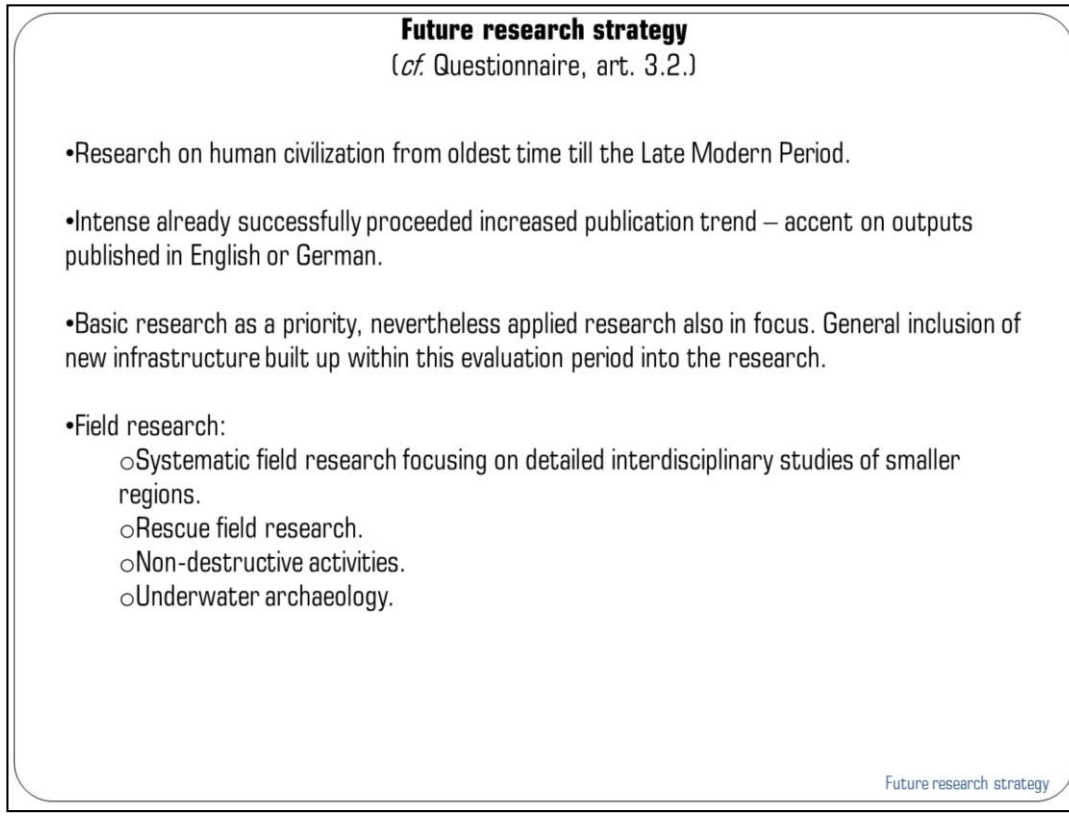
Present state of the art – summary

Future research strategy

Future research strategy

(*cf.* Questionnaire, art. 3.2.)

- Intense and active search for suitable national and international project calls
  - Currently applied projects (2016):
    - ✓1x SF (aimed on reconstruction of natural environment in the past);
    - ✓1x SF (aimed on food supply in the past);
    - ✓1x Interreg – Central Europe – Virtual Archaeology;
    - ✓1x Culture (Education Audiovisual and Culture Executive Agency aimed on the European castles).
  - Projects currently in preparation:
    - ✓Multilateral (4 parties) project (IA, Comenius University Bratislava, RGK Frankfurt a Univ Kiel – within DAAD projects) aimed on securing long-term study stays of PhD. students and post-docs;
    - ✓1x ERC (Prohaszka);
    - ✓1x Marie Curie (Štolcová).
    - ✓1x Horizont 2020 (Teaming)
    - ✓1x Humboldt Stiftung scholarship (Robak)
    - ✓1x Interreg (Archaeopark Bojná)
  - Standard activities:
    - ✓Applying for VEGA, APVV, Schwarz fund, SASPRO grants.



We will definitely continue in the trend of processing older investigations either in form of main tasks or doctoral, diploma and bachelor theses. Terrain research and independent theoretical researches are considered of equal importance and inseparable parts of investigation; out task is to connect them and make them overlap. It will be necessary to elaborate and test new investigative procedures and, most of all, insist on quality and fast publishing of the results in both spheres. Rescue researches should be carried out within business activities and systematic investigations should be part of special nationl or international projects. As for the current terrain investigations, we will focus mainly on the following sites – Bojná, Vráble, Zvolen-Pustý hrad (Deserted castle), Dolné Vestenice, Čierne Kľačany, Nižná Myšľa, Divinka, Santovka, Nitra, Zemplín.

Future research strategy

(*cf.* Questionnaire, art. 3.2.)

•In personnel policy to stabilize number of employees and to continue increasing employee qualification (especially in „higher ranking" categories – supervising scientific workers).

•Possible branch offices extension (for N Slovakia).
•Search for sources to reconstruct other buildings in Nitra „Martinský vrch" to be able to establish the Slovak Centre for Science Popularization, extend modern restoration and conservation laboratories, Slovak Centre of Experimental research.
•Development of department of scientific and technical information.

•Support of business activities in concordance with Foundation Charter (terrain research, expert opinions, exhibitions, etc.).

•Popularization activities – actively adopt the scientific research results in social praxis.

Future research strategy

(*cf.* Questionnaire, art. 3.2.)

•Active international cooperation with European as well as out-of-European partners – three projects of field research cooperation (Kuwait, Guatemala, Sudan) elaborated within evaluated periods, two of them are already successfully running.

•New possibilities of bilateral institutional collaboration arose from improving institute's infrastructure (already running coop. with Czech Republic, Poland, Austria; in prep. coop. with Spain, Italy).

Vision generalization