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28	GERMANY*	Cultural Heritage Service Baden-Württemberg
32	GERMANY	Institute for Landscape Management, University of Freiburg
34	HUNGARY*	Baranya County Museum Authority, Pécs
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The complete Final Report or individual reports from partners can be downloaded from:

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<http://www.muzarp.poznan.pl/EuLandscapes/EuLandscapes/index.htm>

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SLOVAKIA: PUBLIC PRESENTATION OF A STONE AGE PHENOMENON

Dr Ivan Kuzma, for the Archeological Institute of the Slovak Academy of Sciences

Background and objectives

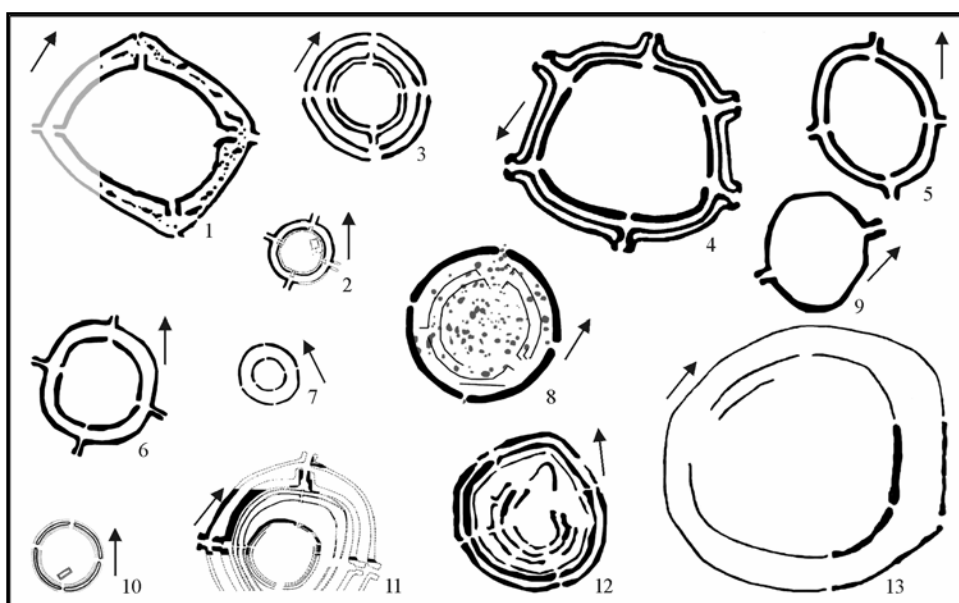
The great stone circle at Stonehenge, in southern England, dating from around the third millennium BC, is one of the world's most famous prehistoric monuments. But significantly earlier, around 6800 years ago, prehistoric societies in Central Europe started to create timber circles enclosed by monumental circular ditch systems. These oldest known monumental structures in Europe have been revealed through aerial survey in Austria, the Czech Republic, Germany, Hungary, Poland and Slovakia. Many of them are sited on fertile loess or on sandy soils and today they are under massive threat of destruction, dramatically accelerated by the intensive agricultural use and industrial transformation of the modern landscape.

The Slovak part of the Culture 2000 project, promoted by the Archeological Institute of the Slovak Academy of Sciences, took as its focus these circular enclosure systems in the south-western part of Slovakia, mostly around Nitra, an area particularly rich in archaeological sites.

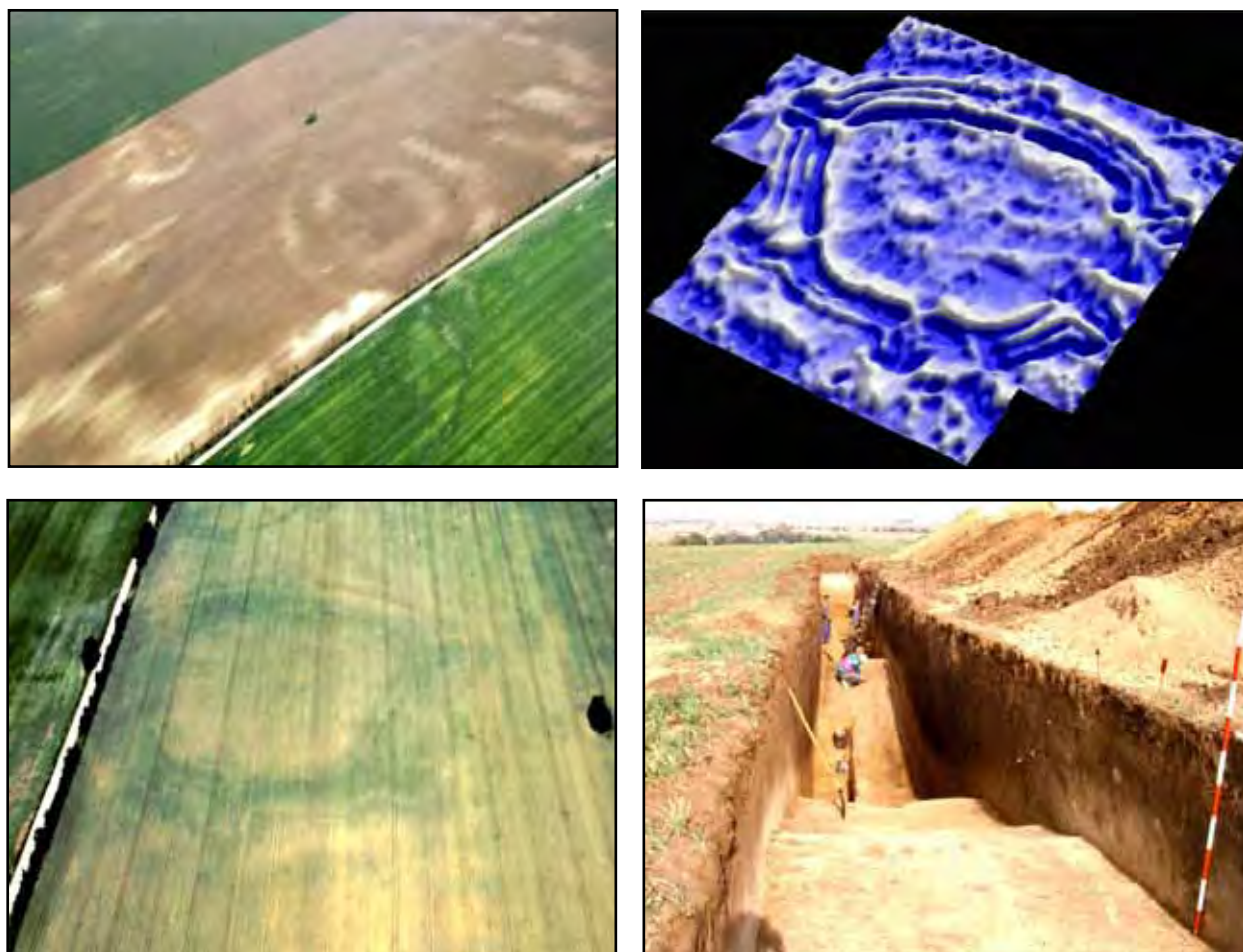
The main objectives of the work were:

- To use aerial survey and related methods of remote sensing, along with ground-based survey, to illustrate the known sites and to discover previously unrecognised examples.
- To present the monuments and their interpretation to the general public, using new technologies made possible by the Culture 2000 funding.
- To engage in discussion with Culture 2000 co-partners about the interpretation of the Slovakian evidence and the wider European phenomenon.
- To train young archaeologists in aerial survey and thereby contribute to the preservation of these remarkable features of the shared European cultural heritage.

Aerial exploration throughout the project revealed many new archaeological sites and the resulting data were prepared for analysis and public presentation. Discussions were held with specialists throughout Europe and Slovakian students and young research workers took part in various aspects of the project, including active aerial photography.



Plans of Neolithic circular timber structures in Slovakia, the principal subject of aerial exploration and presentation work within the Culture 2000 project.



Air photographs, geophysical data and excavations across the massive ditches of the Golianovo site.

Aerial photography, field survey and geophysical prospection

Aerial survey is one of the most effective methods of archaeological investigation. When combined with innovative technologies such as digital aerial photogrammetry and high-resolution magnetic prospection, as within the Culture 2000 project, the technique becomes even more effective.

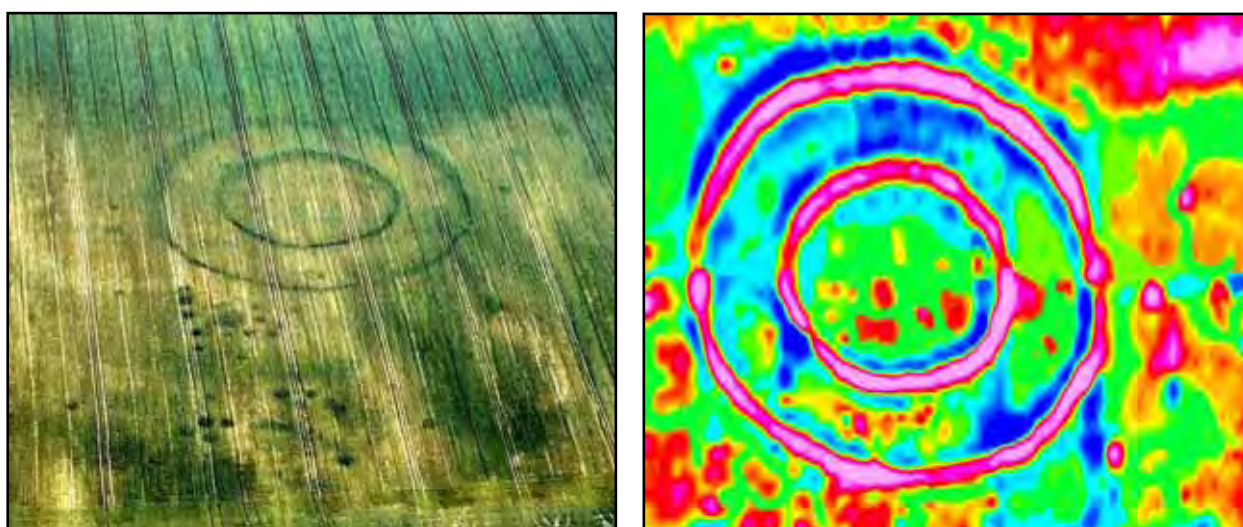
Before aerial survey only a small number of circular enclosures were known in Slovakia, as a result of traditional field survey. By the end of the Culture 2000 project, with its programme of aerial survey, more than 60 are known, 20 of them in the chosen study area close to Nitra.

During the project systematic aerial survey was undertaken in flights over western Slovakia. Many known archaeological sites were photographed, along with approximately 120 entirely new features, including 15 new circular enclosures. Field-walking and geophysical prospection on selected sites, using a caesium magnetometer, produced excellent results in most cases. Cataloguing, indexing and archiving of the air photographs (taken in digital format throughout) has been completed and preparation of the air-photo database is well advanced, along with the archaeological interpretation and mapping of selected sites.

The enclosures range from 30 to 300 m in diameter. Some of the more simple ones, especially those that are oval in shape, may date to the Bronze Age, along with circles from 5 to 20 m in diameter, which probably served funerary functions in the Bronze Age or later periods. It seems fairly certain, however, that the double and multiple circular features with diameters of more than 60 m belong predominantly to the Neolithic period, and in particular to the Central European Lengyel Culture. Not all of them, however, have produced datable finds from



Air photograph, geophysical plot and plan of the quadruple-ditched site at Cífer, in Trnava district. Its layout suggests that it may have been built in two phases, each consisting of two ditches.



Air photograph and caesium magnetometer survey of the relatively simple double-ditched site at Kľačany in Hlohovec district, its two ditches measuring respectively 35m and 62m across.

excavation or surface collection. Verification by excavation is problematic in structures of this size. The assumption that small-scale excavation might not give clear-cut results was confirmed, though there were enough finds in most cases to support the general dating.

Data processing and interpretation

The data from aerial reconnaissance, terrestrial survey and geophysical prospection, along with topographical and land registry information, were entered into the Institute's GIS to facilitate the standardised mapping and interpretation of the various sources of information. The local environment of the circular monuments was then examined through the thematic layers of the GIS, focusing on the inter-site analysis of water supply, site characteristics, mutual visibility, settlement patterns, sustainability and agricultural potential.

These spatial analyses, already well advanced for some of the sites, may contribute significantly to a better understanding of their function (or functions) and significance to the societies of their time. It will be interesting, for instance, to investigate the mutual visibility of sites in relation to the orientation of their gates and internal features. Such analyses and interpretations, however, have limitations, both because of the methods used and because of the quality and quantity of the input data. The basic and necessary assumption – not always capable of verification – is the simultaneous existence of structures which lie technically within sight of one another.



Public presentation

Work within the Culture 2000 project has been used to develop functional interpretation models. Based on prospection and excavation data, standardised datasets have been used to create virtual reality models, of which one is illustrated above. These have been produced at differing degrees of detail for use in virtual simulations and presentations to research workers, schoolchildren, young adults and the general public. Some of the results will shortly be placed on the Internet, in a site under preparation for the Institute, with a home page for scientific and public access and a virtual exhibition.

Broadcasting companies have been invited to document and popularise the project and to explain the place of these fascinating Stone Age monuments, both in Slovakia and in the broader European context. The film made within the Czech part of the project, in close cooperation with the Slovak team, will also be offered for transmission in Slovakia.

Meetings and specialist discussion

The function of the circular enclosures has been widely debated for more than two decades, as has their relationship with the later phenomenon of timber circles, henges and palisaded enclosures in Britain. The project leader, Dr Ivan Kuzma, has contributed discussions of the circular enclosures and their interpretation, both regionally and as part of a pan-European phenomenon, to local and specialist journals in Slovakia, Poland and Germany. He also wrote on the subject (with Dr Jan Tirpák) in a special issue of *Contributions to Geophysics and Geodesy*, published in Bratislava in 2005 and made a later contribution in the published *Proceedings of 7th International Conference on Archaeological Prospection*, held at Nitra in September 2007. This conference, organised by the Dr Kuzma and his Culture 2000 team, attracted 99 participants from 23 countries, from as far apart as Australia and Russia, the United Kingdom and Japan.

Discussions have been held with specialists at various meetings associated with the Culture 2000 project. Contributions and contacts have also been made at meetings of the Aerial Archaeology Research Group, at the Archaeological Prospection conference at Rome in 2005 and at the final meeting of the Culture 2000 co-partners in Prague. Slovakian material was also presented in the major exhibition opened at the Czech National Museum in October 2007.

General assessment of the project

The main objective of the Slovakian part of the project was the popularization of these oldest European monuments in their context as an early pan-European socio-ritual phenomenon. The Culture 2000 funding helped the Institute to fulfil these aims, especially through the use of new technologies in processing and interpreting the data and in presentation of the results to the general public. Also important were the consultations at the European scale with other project partners. Last but not least the project allowed the training of young Slovak archaeologists in aerial survey – a contribution to the future of our shared European cultural heritage.



HIGHLIGHTS 2004-2007

Belgium Air photographs uncover the battlefields of Ypres

Czech Republic Air survey, excavation and a grand exhibition

English Heritage Air photo training schools at home and abroad

Estonia Estonian archaeologists take to the air

Germany (Mecklenburg-Vorpommern) Seeing beneath the waves

Germany (Baden-Württemberg) Iron Age fortresses in their landscape setting

Germany (Freiburg) Airborne laser scanning to 'see through the trees'

Hungary Combining techniques to explore the Neolithic

Italy (Puglia) Uncovering and mapping the past through aerial survey

Italy (Salento) Modern techniques and a Roman harbour

Italy (Tuscany) Air survey, laser scanning and geophysics

Lithuania Raising awareness through aerial archaeology

Poland New discoveries and new systems for heritage conservation

Slovakia Stone Age monuments from the air and on the ground



A LOST TOWN RE-FOUND

Szamotuly, in Poland is a medieval town, its originally open market square now filled with later buildings (top). Until recently historians believed that the town always occupied its present site. This view changed dramatically in July 2006 when spectacular air photographs, taken as part of the Culture 2000 project, revealed its original location at Mutowo, 2.5km away, where it had stood before a disastrous fire in the 14th century. One of the photographs is shown here (centre), rectified to fit the present-day map. In the bottom image the town's large open square, outlined by the dark marks of cellars beneath its surrounding buildings, has been plotted on the rectified photograph, along with the presumed lines of the linking streets.

