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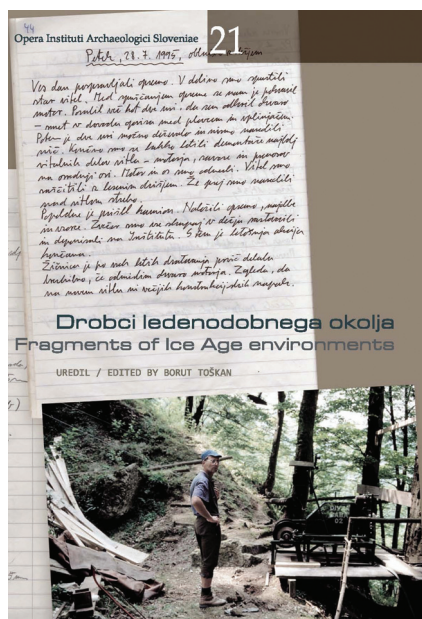
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Reviews

Drobci ledenodobnega okolja. Zbornik ob življenjskem jubileju Ivana Turka / Fragments of Ice Age Environments. Proceedings in Honour of Ivan Turk's Jubilee. Borut Toškan (editor), Opera Instituti Archaeologici Sloveniae, 21, Ljubljana: Inštitut za arheologijo ZRC SAZU, Založba ZRC, 2011, 280 pages, 44 b-w photographs, 10 drawings, 52 tables, 71 graphs, 9 maps. ISBN 978-961-254-257-3



In the year 2011, the Institute of Archaeology of the Slovenian Academy of Arts and Sciences in Ljubljana came up with the idea of publishing proceedings dedicated to the prominent researcher of the Slovenian Palaeolithic, Ivan Turk. These proceedings have been named "Fragments of Ice Age Environments". The editor, Borut Toškan, contacted a considerable number of both local and foreign scientists resulting in a collection of papers compiled in honour of Ivan Turk on the occasion of his sixty-fifth birthday.

The content of these proceedings generally reflects areas which Turk's career has been dedicated to, or which have been the subject of his scientific interest. The monograph thus presents a compilation of

seventeen chapters in which experts from various scientific fields discuss specific topics related to the Ice Age in Europe. This review should serve as an overall guide through all the articles published therein.

Ivan Turk's life, work, primary achievements and selected bibliography (from 1971 to 2009) are briefly presented in the introductory chapter by Anton Velušček. He describes how Ivan Turk and his research significantly influenced the development of Slovenian archaeology. Turk has always supported interdisciplinary research and has had the opportunity to engage in archaeozoology himself. He became an expert on the cave bear (*Ursus spelaeus*). He was undoubtedly also one of the first Slovenian scientists who understood the importance of radiometric methods for dating in archaeology. He introduced precise and interdisciplinary handling of sediments and additional residue, which represent an important source of information about previous environments, economies, etc. for Slovenian archaeology. Another of Turk's important achievements has been the up-to-date publishing of the results of each excavation season at the cave site of Divje babe I and the results of sample trenching at a number of other caves. A number of them are also mentioned in additional articles in this monograph.

The chapters in this proceedings are consequently devoted to the presentation, analysis and interpretation of palaeontological data concerning various large mammal species ranging from the mastodon and mammoth to the cave hyena, ibex, cave lion and bears, with an emphasis placed on the cave bear.

The first academic article by Vasja Mikuž and Jernej Pavšič from the Department of Geology of the University in Ljubljana deals with the remains of a mastodon tusk from the species *Anancus arvernensis* which was discovered in 1997 in the Early Villafranchian clastites in the broader area of Kicar near Ptuj. It is thus far one of the few mastodon remains that have been registered in this part of Slovenia. In another article both authors also present two larger parts

of a mammoth tusk which was discovered in the Kamnica gravel pit near Drnovo in the Krka river basin and which has been ascribed to the Late Pleistocene species *Mammuthus primigenius* (Blumenbach). Such finds are extremely rare in the broader area of the Krka river basin.

The Austrian paleontologist Martina Pacher presents fossil and subrecent ibex (*Capra ibex*) from Austrian and Eastern Alpine caves, particularly from Salzofenhöhle (excavated between 1924 and 1964). The material containing 221 specimens is presented in detail for the first time and compared with ibex remains from the Drachenhöhle near Mixnitz, Styria and the Upper Palaeolithic loess site of Willendorf, Lower Austria, along with the inclusion of remains of ibex from sites in Slovenia. Ibex remains are mentioned here for the first time from the Potočka Zijalka cave.

Only one article in these proceedings discusses finds from the Czech Republic. Cajus G. Diedrich from the PaleoLogic, Private Geoscience Research Institute in Halle, Germany, devoted his contribution to a male lion skull of *Panthera leo spelaea* (Goldfuss 1810) and postcranial remains from the Sloup Cave in the Moravian Karst (found in 1998 and housed in the Anthropos Museum Brno), together with a partial historical find of a skeleton (housed in the Natural History Museum Vienna). The lion material from Sloup was found along with a number of postcranial bones at a hyena den area with other accumulated hyena prey bones, but also with a skull and limb bones deeper in the cave among numerous cave bear remains in the cave bear den area. The absence of juvenile lion material demonstrates once again that these extinct carnivores were imported by hyenas as prey or carcasses. Such a taphonomic situation with adult lion remains found deep in cave bear hibernation den caves helps to explain the presence of lion skeleton remains in Europe. Those steppe lions were cave dwellers who would steal their prey at hyena commuting den cave entrances, and would hunt down cave bears during their hibernation, particularly in winter time.

The antagonistic battle between lions and hyenas/cave bears must have ended fatally in certain cases in the cave itself for the lions.

Another article from Serbia by Vesna Dimitrijević deals with one of the few finds of hyenas. The fact is that the majority of caves in Serbia which contain Pleistocene deposits have been “bear caves”. The only up until now confirmed hyena den cave is Baranica Cave (south-east Serbia, valley of the river Trgoviški Timok, near Knjaževac). It is a composite cave with two parts designated as Baranica I and Baranica II. There is a wealth of herbivorous and carnivorous species remains, although hyena remains predominate. Bone fragmentation is high, mostly due to damage made by hyena teeth. There was competition for the living space among the cave hyena and other carnivores, as well as humans, although the hyenas had assumed a major role in Baranica I and maintained an inviolable den site in Baranica II. The article discusses the competition for the living space in Baranica between the carnivores in which cave hyena dominated.

As written above, the primary emphasis in these proceedings has been placed on cave bears. The study by Preston T. Miracle from the Cambridge University presents a detailed analysis of the sex structure of the Krapina cave bear assemblage and compares it with other sites in the region. Moreover, the results are related to the Neanderthal life style.

The Spanish authors Aurora Grandal-d'Anglade, Marta Pérez-Rama and Daniel Fernández-Mosquera from the University of Coruña review in their article the available isotopic data arising exclusively from well-contextualized cave bear sites, and explore how the climate can influence the physiology of cave bears through their hibernation length and, in turn, the isotopic signatures registered in their bones. Both diet and physiology depend very directly on the environmental conditions in which the organisms lived, conditions which have varied considerably along the Pleistocene.

The German scientist Kerstin Athen provides a gender analysis of brown bears based on the metrical data of brown bear (*Ursus arctos*) metapodial bones of the Naturhistoriska riksmuseet in Stockholm. The data were statistically analysed using univariate as well as discriminant methods in order to find distinguishing features linked to sexual dimorphism. The results indicated that this material, of which the gender was known *a priori*, could successfully be separated into the two

gender groups. In the two-sample tests, 89% of the examined parameters revealed significant differences between males and females, verifying sexual dimorphism. Two to three variables each were extracted in eight out of ten skeletal elements using discriminant analysis, which showed a significant distinction between the gender groups. The results should help separate fossil material into gender groups. The findings of these separate investigations on fossil gender groups should help to reach an understanding of genetic changes over a certain geological period of time.

A similar study which could help scientists understand the Pleistocene period is provided by the biologists Đuro Huber (Biology Department of the Veterinary Faculty, University of Zagreb) and Goran Gužvica (OIKON Institute for Applied Ecology). Their study presents basic data on the biology of recent brown bears (*Ursus arctos*) which may help towards understanding certain elements of cave bear (*Ursus spelaeus*) life. Both species belong to the same genus and were sympatric in large parts of current day Croatia and Slovenia at one period of their evolutionary history. A long term study (since 1981) of brown bears in Croatia provided a certain amount of scientific data. The fields of research that may be relevant for a comparison with cave bears consist of denning ecology, reproduction and growth, movements, habitat requirements, activity patterns and feeding habits. These themes should be concerned with the fundamental question: why did the brown bear survive to the present day, while the cave bear did not?

The Italian scientists Giovanni Boschian and Annamaria Desantis from the Department of Archaeology from the University of Pisa present a geoarchaeological study of the Caverna degli Orsi / Medvedja jama that is at present the only site of the early Late Pleistocene age whose sequence can be studied in terms of palaeoenvironmental evolution in the Trieste Karst area. Even if no geochronometric datings are available at present, the age of the sequence has been estimated by biostratigraphy, and considering that Mousterian tools – *i.e.* about 40 ka BP – were also found.

Several chapters in these proceedings address the topic of Last Glacial climatic conditions in the southeastern Alps by studying fossil micromammal and palaeobotanical remains as well as geoarchaeological data.

Borut Toškan and Janez Dirjec from the Institute of Archaeology of the Slovenian Academy discuss the Palaeoenvironment at the boundary between the Early and Middle

Würm in the surroundings of Divje babe I (Slovenia), major climatic changes revealed by tiny fossils. The all-round manner of dealing with the Divje babe I cave site provides a good opportunity to combine palaeoclimatic (palaeoenvironmental) approximations based on the individual remains of mammal microfauna to those emerging from other palaeontological, palaeobotanical and sedimentological data. Although individual groups of finds as a source of information are not always synchronized, the setting of the boundary between moderate and cold climates, between dry and humid ones, in the period between 70,000 and 80,000 years ago does not seem to be questionable.

An interesting study has been provided by Janez Turk, the son of Ivan Turk. He described here an issue which was first noticed by his father in his doctoral dissertation: the climatostratigraphic classification of sediments in the western sector of Potočka Zijalka cave, based on a reconstruction of snow conditions at the time of their deposition. He analysed the differences between sediments accumulated during cool and humid climatic periods in the Pleistocene, and warm periods, such as the Holocene.

Two studies are related to palaeobotanical research in Slovenia. Metka Culiberg from the Institute of Biology of the Slovenian Academy provides an overview of certain Palaeolithic sites with a special focus on charcoal and pollen. A significant part of the study is dedicated to the Mousterian cave site Divje Babe I from the Middle Würm which is undoubtedly the richest Palaeolithic site in Slovenia (the profile includes 23 layers). Maja Andrič from the Institute of Archaeology in Ljubljana compares late glacial (Bølling, Allerød and Dryas I–III) vegetation at two sites, Lake Bled (northeastern) and Griblje marsh (southeastern Slovenia).

A special article from Matija Turk and Ljuben Dimkaroski (academic musician) is devoted to a comprehensive review of previous analyses of a Neanderthal bone flute (a perforated femur of a cave bear found in 1995) from Divje babe I, but also includes new musicological research findings on the extraordinary technical capabilities of this ancient musical instrument which has been the subject of many a heated discussion on its origin since its discovery. They are persuaded that there is no doubt that it is of artificial origin. The layer, in which the flute was found, is ESR dated to between 60 and 50 ky in the past. The flute from Divje babe I is currently considered the oldest instrument and the first known to have been made

by Neanderthal hands. In their opinion its technological perfection points to the high cognitive abilities of Neanderthals.

The concluding chapter from Dragan Božič presents a retrospective study of old manuscripts and printed sources, providing certain interesting insights into the discovery of one of the most significant palaeontological sites in Slovenia, the cave of Mokriška jama, and also deals with two interesting finds, a cave bear skeleton and a wild boar skull found there in the 19th century.

To sum up, these proceedings are an excellent contribution to understanding

life in the Ice Age in an interdisciplinary manner. Ivan Turk, whom this monograph is dedicated to, was and is one of those progressive scientists who understands a need for interdisciplinary cooperation. This collection of articles provides both old and new research ranging from archaeozoology, palaeobotany, to archaeology, in order to provide a better view of the palaeoenvironment, in Slovenia and elsewhere.

The entire Slovenian monograph is a brilliant example of how to publish scientific articles and present them to a

wider audience. It is bilingual, in both the Slovenian and English language and thus can provide an improved understanding of research on the international and interdisciplinary level and can lead to new international and interdisciplinary scientific cooperation. Moreover, these proceedings can be found on the Internet free of charge. Online access to papers written in different languages is an excellent way to reach a better understanding of international research (not only in archaeology) and can bring the results of this research to light throughout the world.

Roman Bortel

