

## CHANGES IN NATURAL ENVIRONMENT IN THE VICINITY OF OSŁONKI (KUJAWY, CENTRAL POLAND) IN THE LIGHT OF GEOLOGICAL AND GEOMORPHOLOGICAL INVESTIGATIONS

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**ABSTRACT.** GEOMORPHOLOGICAL AND GEOLOGICAL STUDIES IN THE VICINITY OF A NEOLITHIC STRONGHOLD AT OSŁONKI IN KUJAWY REGION REVEALED SUCH LANDFORMS AS GROUND MORAINES, GLACIAL TROUGH, AND BIOGENIC PLAINS. THEY WERE FORMED UNDER THE IMPACT OF DIRECT ACCUMULATION OF AN ICE-SHEET, ITS MELTWATER, AND BIOGENIC ACCUMULATION. DETAILED ANALYSES OF THE RELIEF AND DEPOSITS USING PALAEOBIOLOGICAL STUDIES MADE IT POSSIBLE TO RECONSTRUCT RELIEF DEVELOPMENT AND ENVIRONMENTAL CHANGES IN THE PIENI-VISTULIAN, LATE VISTULIAN AND HOLOCENE. THE LANDSCAPE FROM THE TIMES WHEN PREHISTORIC MAN OCCUPIED THIS AREA IS PRESENTED.

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### INTRODUCTION

Very intensive archaeological investigations in the vicinity of Brześć Kujawski have been carried out for many decades. The history of these investigations has recently been discussed in detail by GRYGIEL (2004) in a very extensive monograph. From the beginning of the 1970s, Grygiel has been investigating the relics found in Brześć Kujawski (GRYGIEL 1976). When in the 1990s he expanded the area of his investigations, he found a defensive Neolithic settlement at Osłonki, about 7 km north-west of Brześć Kujawski (GRYGIEL and BOGUCKI 1994). As a result of further penetration of the areas adjacent to Osłonki new sites were discovered, namely at Miechowice and Konary. The settlement was then the object of detailed modern excavation work, carried out on a very extensive area.

In addition to excavation work, analyses of selected elements of the natural environment in the area very close to the archaeological sites were made at the initiative of Ryszard Grygiel by an interdisciplinary team of research workers. The analyses were aimed, first of all, at the reconstruction of the living conditions of a pre-historic man. Reconstruction work included attempts at explaining what happened earlier and what happened later, until historical times.

## LATE GLACIAL AND HOLOCENE HISTORY OF VEGETATION AT OSŁONKI (KUJAWY, CENTRAL POLAND)

Dorota NALEPKA

**Abstract.** Changes from unforested area during Bølling (Late Glacial) up to forested one during Atlantic (Holocene) time in south Kujawy region was done by pollen analysis. The influence of early Neolithic farmers (Linear Pottery culture, Lengyel culture and Globular Amphorae culture) on the vegetation cover was characterized, as well as the agriculture near the archaeological site at Osłonki was interpreted on the basis of pollen analysis.

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### INTRODUCTION

The southern Kujawy region has been intensively used for agriculture due to its fertile soils (JAŹDŹEWSKI 1938, GRYGIEL 2004, GRYGIEL and BOGUCKI 1997) since the early Neolithic time. Studies on the Late Glacial and the Holocene vegetation history of this area were done by pollen analysis (NALEPKA 2005). Special attention was paid to the vegetation development under natural and anthropogenic circumstances.

### RESEARCH AREA, MATERIAL AND METHODS

The Osłonki region is situated in the south-eastern part of the Kujawy Lake District (KONDRACKI 1994) in Central Poland. The archaeologically explored sites are located in the Osłonki (52°37'N, 18°48'E), Miechowice and Konary villages (Fig. 1). At present, the majority of the area is used for agricultural purposes, but among them three flat-bottom basins filled with biogenic sediments are present (NOWACZYK *et al.* 2002, and in this volume). All of them were drained in the twentieth century, and in the late 1990s one of them was turned into a fish-pond, as the organic sediments were dug up for gardening purposes. A detailed description of the geomorphological investigations and results is presented in a separate paper (NOWACZYK, this volume).

Palynological analyses done from three cores obtained from two of these basins filled with biogenic sediments were the basis for description of environmental changes;

## RESPONSE OF CLADOCERA (CRUSTACEA) TO NEOLITHIC SETTLEMENT AT OSŁONKI (KUJAWY REGION, CENTRAL POLAND)

Michał GAŚSIOROWSKI

**Abstract:** Analysis of cladoceran remains was done on two cores from fossil lakes located near the Neolithic settlement site at Osłonki (Kujawy region, Poland). The cores provide records started from the Alleröd and the Younger Dryas, respectively. The cladoceran remains were used to reconstruct natural and anthropogenic eutrophication and changes in water ecosystems. Both water bodies were shallow and clear-water lakes during the Late Glacial period. Since the beginning of the Holocene, climatic and biotic changes induced natural, slow and gradual eutrophication. The evidence of intensive eutrophication started with the first occurrences the pollen and spores of crops and weeds. Human settlement caused significant changes in cladoceran species composition. The first occurrence of crop pollen was coincident with decline of plant-associated species and increase of euplanktonic taxa tolerant to high nutrient concentration.

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### INTRODUCTION

Excavations at Osłonki have discovered one of the largest settlements of early farmers in Polish Lowlands (GRYGIEL and BOGUCKI 1997). 30 trapezoidal houses and 80 graves constituted this Lengyel village. The intensive archaeological investigation combined with radiocarbon datings showed that this village was well prospered between 4,500 and 4,300 years BC (NALEPKA 2005). Intensive palaeobiological investigations have been conducted in the nearby Osłonki village since 1994 (NALEPKA 1999, 2004, 2005, GAŚSIOROWSKI and NALEPKA 2004, GAŚSIOROWSKI, submitted).

Cladocera analysis has been used to track human impact on the water environment for many years (e.g. SZEROCZYŃSKA 1985, 1998, SCHMIDT *et al.* 2000). Even Mesolithic and Neolithic settlement changed a trophic state in small lakes and ponds. This activity was also reflected by changes in the presence and frequency of some Cladocera species remains, especially sensitive to shortages or overloads of nutrients.

## MALACOFUNA OF LATE QUATERNARY LACUSTRINE DEPOSITS AT OSŁONKI (KUJAWY, CENTRAL POLAND)

Stefan Witold ALEXANDROWICZ

**Abstract.** Successions of mollusc assemblages were described from two borehole cores drilled in the archaeological site at Osłonki. They indicate changes of sedimentary conditions and the environment in particular parts of the ancient melt-basin during Late Glacial and Holocene time. The section of lake sediments of pre-Allerød – Subboreal age, passing upwards into younger ones and deposited within swamps and marches, represents the south-western part of the basin. In the north-western part the deposition began some time later, but not before Allerød. Initially it took place on swampy and flooded meadows, which were transformed into a lake existing during the Early and Middle Holocene and drying up in the Late Holocene. The human impact had a substantial influence on the temporary impoverishment of the mollusc fauna.

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### INTRODUCTION

Rich and differentiated assemblages of molluscs occur in Late Vistulian and Holocene sediments filling the ancient melt-lake in Osłonki, about 20 km westward of Włocławek. They were found during excavations carried out within the framework of interdisciplinary investigations of the Early Neolithic settlement of the Linear Pottery Culture and the Lengyel Culture, an important and particularly interesting archaeological site known in this region (NALEPKA 1999, 2004a,b, 2005a,b, and in this volume; GAŚSIOROWSKI, in this volume, GAŚSIOROWSKI and NALEPKA 2004, GRYGIEL 2004, NOWACZYK and NALEPKA 2005, NOWACZYK *et al.* 2002, NOWACZYK, in this volume).

Malacological study is based on 84 samples delivered to the author by Prof. B. Nowaczyk and Dr. D. Nalepka. Two sections of lacustrine deposits were taken into consideration. One of them – the borehole core “94–9”, situated in the SW part of the basin is represented by 76 samples from the deepest zone of the lake (see also Tab. 3 in NALEPKA, this volume). Another core (“16”) characterises the SE part of the basin and includes only 8 samples (see also Tab. 4 in NALEPKA, this volume). Both indicate the evolution of the lake and changes of the environment controlled by climate and human impact.

The described subfossil fauna of molluscs comprises 41 taxa (more than 11 thousand specimens). These are 14 species of land snails, 19 species of water snails and 6 species of bivalves, as well as shells of slugs identified conventionally as *Limacidae* and opercula of the water snail *Bithynia*. The following ecological groups of molluscs have been distinguished:

## THE SCULPTURE OF ELYTRA IN SPECIES FROM THE FAMILY DYTISCIDAE (INSECTA: COLEOPTERA) AS A DIAGNOSTIC FEATURE FOR THE IDENTIFICATION OF SUBFOSSIL MATERIAL

Mieczysław MAZUR and Daniel KUBISZ

**Abstract.** Three categories of the elytral sculpture in the dorsal area of 138 central European Dytiscidae species have been distinguished, i.e.: macrosculpture, first-degree microsculpture, and second-degree microsculpture. On the basis of a kind, arrangement, and quantitative proportions of eight sculpture elements (punctures, sulci, clefts, granules, areas, stripes, carinae and folds), 14 types and 39 varieties of the sculpture have been described. Additionally, sexual dimorphism of and seven other types of the sculpture, not related to the sex have been distinguished. Importance of the discussed sculpture features for the identification of the subfossil Dytiscidae remains was stressed. Using the diagnostic features, a key for identification of subfossil Dytiscidae was compiled.

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### INTRODUCTION

The numerous and widely distributed family Dytiscidae is also numerous represented in the fossil material. The oldest remnants of contemporary species originate from the Upper Miocene (GALEWSKI and GŁĄZEK 1973, 1978) and in the Quaternary deposits (and particularly Holocene ones) they are regularly found (COOPE, 1969; ELIAS, 1983; LEMDAHL, 1988; NAZAROV, 1984; PAWŁOWSKI *et al.*, 1987; PEARSON, 1963). The remnants of Dytiscidae have been preserved in large amounts because these beetles lived in the environments (i.e. different water reservoirs), which provided particularly favourable conditions for fossilisation.

The aim of this study is to describe the diverse and variable sculpture of the dorsal area of elytra in Dytiscidae (Fig. 1.1). Difficulties in identifying the subfossil remnants of these beetles inclined us to deal with this problem. The existing descriptions are based mainly on features that have not been preserved in fossils, such as the structure of legs and ventral part of the body. Specimens found in the Quaternary deposits are usually much damaged and incomplete, and single elytra constitute large part of the material (NAZAROV 1984). Keys for the identification of the contemporary members of this family (e.g. FRANCISCOLO 1979, SCHAEFLEIN 1971, ZAITSEV 1953) treat the body sculpture as one of many diagnostic