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UDC 551.4(438)

## ENVIRONMENTAL CONSIDERATIONS OF THE JATWIEŻ DUŻA SITE AS A SYMBOL OF THE NETWORK OF LUSATIAN ASHFIELD COMMUNITY OBJECTS AND HUMAN- ENVIRONMENT RELATIONS, NE POLAND

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This paper presents the results of a study of the environmental context of the archaeological site of Jatwież Duża. Two geological sections across were made for this survey. One through the main depression of the microregion of the site in which the Brzozówka river flows, and the other in the left tributary of the Biebla river.

**Key words:** Podlasie; Brzozówka catchment; geoarchaeology; Holocene; Bronze Age.

В статье представлены результаты исследования экологического контекста археологического памятника Jatwież Duża. С этой целью были сделаны два геологических поперечных разреза. Один через главную впадину микрорегиона участка, в котором протекает река Brzozówka, а другой – в левом притоке реки Biebla.

**Ключевые слова:** Подляшье; водосборный бассейн Brzozówka; геоархеология; голоцен; бронзовый век.

*Introduction.* The research region is located in NE Poland in today's Podlasie voivodship (Fig. 1). The functioning of Late Bronze Age and Early Iron Age defensive structures in the northern Podlasie region is a new issue, the knowledge of which is the result of only of the last few years of research. The breakthrough in archaeology brought about by the spread of laser scanning imaging made it possible to discover and inventory 27 such structures located in the Biebrza and upper and middle Narew river valleys (fig. 1). All of them showed many similarities – from their spatial location to their form, type of construction and dimensions [1, 2].

This region dominated for ages by groups of communities with a hunter-gatherer economy only at the turn of the Subboreal and Subatlantic becomes an oecumene of Lusatian culture. It seems that this community is the first a centre of coherent network of sites, which can be associated with a stable settlement network and intensive agricultural use of the environment [1, 2].

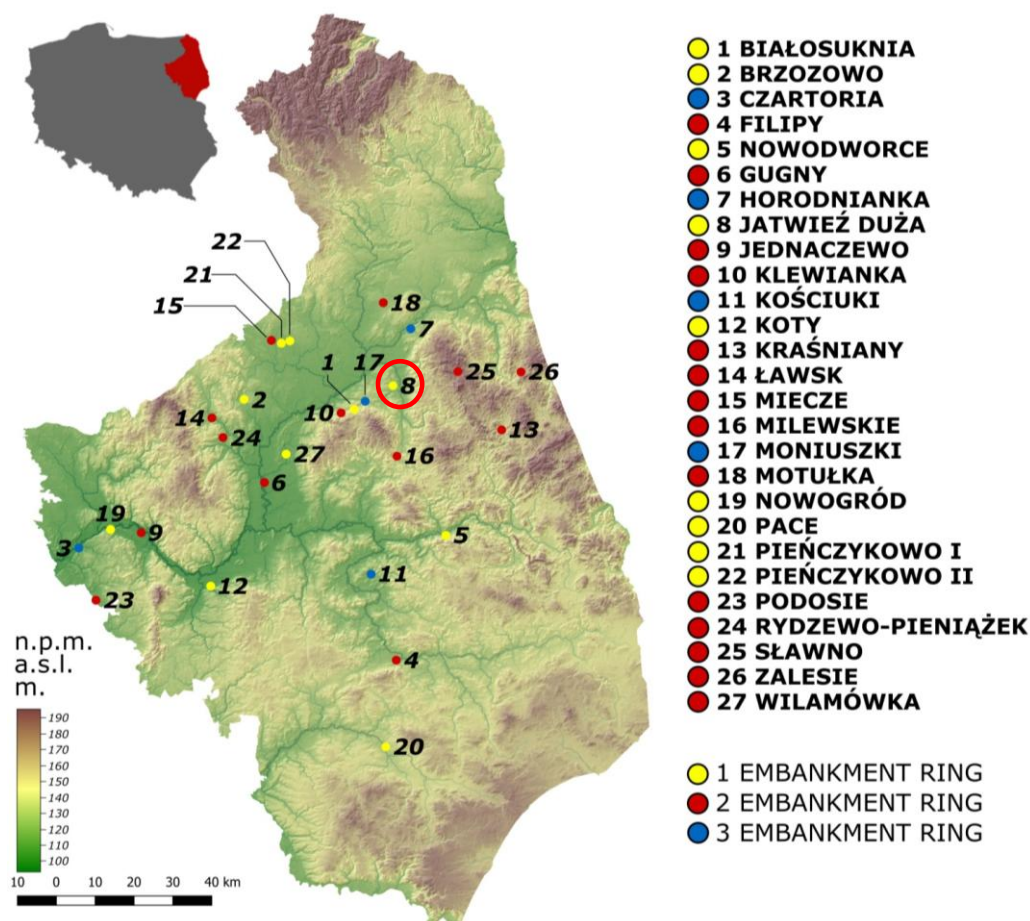


Figure 1 – Location of the research area with the network of similar site in the Podlaskie voivodeship with location of Jatwież Duża site marked; data GUGiK, DEM 100 × 100

The network of these Prehistoric, Late Bronze Age and Early Iron Age structures has relatively uniform location and structure. They are mainly located in the basins of the two main rivers of the region – Biebrza and Narew. In terms of their construction they have a circular arrangement with two areas – a protective area consisting of a system of ditches and embankments and a central area consisting of a flat central square [1, 2].

*Aim of study and methods.* To determine the environmental context of functioning of the Jatwież Duża site, a series of geological boreholes was made across the bottom of the Brzozówka and Biebla river valleys adjacent to the site (fig. 4 A and B).

Sedimentological analyses were made in the Geomorphological and Hydrological Laboratory of the Institute of Geography and Environmental Sciences of Jan Kochanowski University in Kielce. The used methods included grain size of mineral sediments with the sieve method and laser method. The content of organic matter was determined by the loss on ignition method. The obtained results are presented in graphical form in the GRANULOM program together with calculated Folk-Ward parameters. Standard  $^{14}\text{C}$  dating of organic material from the boreholes was carried out at the Laboratory of Absolute Dating at Skala.

On the basis of results of these analyses the cross sections of the Brzozówka and Biebla river valleys were determined.

The mapping of the Archaeological Map of Poland (AMP) data was carried out to determine the potential settlement of the both areas during different periods.

*Results.* In the Brzozówka river depression 23 geological boreholes were drilled, which is directly adjacent to the Prehistoric site (fig. 2A). On the basis of geological boreholes within the

Brzozówka depression we can distinguish three segments of different structure and origin (fig. 3). There are: sand terrace segment built of sandy and gravel sediments, width ca. 1 600 m; peat plain segment with 0.5 to 2.0 m thickness of organic sediments which started to grow since the beginning of the Holocene on uneven mineral substrate, which may be a remnant of palaeochannels of the former meltwater system, width: about 1 800 m; alluvial segment accompanying the present-day riverbed, built up from sands of meandering river deposits, 200–300 m wide [3].

Eight geological drillings were made in the Biebla river valley (fig. 2B), which is a left-side tributary of the Brzozówka river. The asymmetric valley bottom made up of gravels and sands is filled with a compact peat cover. In borehole B3A we can distinguish 3 levels of accumulation of organic matter, which started to grow from the early Holocene to the Atlantic. Since 3 660 BP onwards there is a decrease in organic matter content in drill 3 (fig. 4; profile B3A). It is most likely related to the settlement of the catchment area during this period. Decrease in organic matter may be caused by deforestation of the catchment area and initiation of soil erosion processes [4].

Data from the Archaeological Map of Poland, e. g. from the microregion of the Jatwież Duża site (radius 5 km from the site). The site recorded 64 points of community activity from the Bronze Age but only 1 from the Mesolithic, 4 from the Neolithic, 9 from the Iron Age and 1 from the Medieval period (fig. 5).

This settlement has led to a precipitation of the natural environment from entropy and its transformation. The use of natural resources for the needs of this community can be observed in the drainage basins of the river Brzozówka and its left-bank tributary Biebla. Intensive deforestation of the area caused a decrease of organic matter content in peats, which have been growing in both valley floors since the Preboreal period (9 770–9 180 BP). This change took place after 3 660±50 BP (Biebla) and after 1 870±60 BP (Brzozówka).

Determining the function of the objects in this network is extremely difficult. There are many indications that we are dealing here rather with a kind of stable socio-administrative-religious centre concentrating dispersed in the microregion population of the Lusatian ash fields culture.

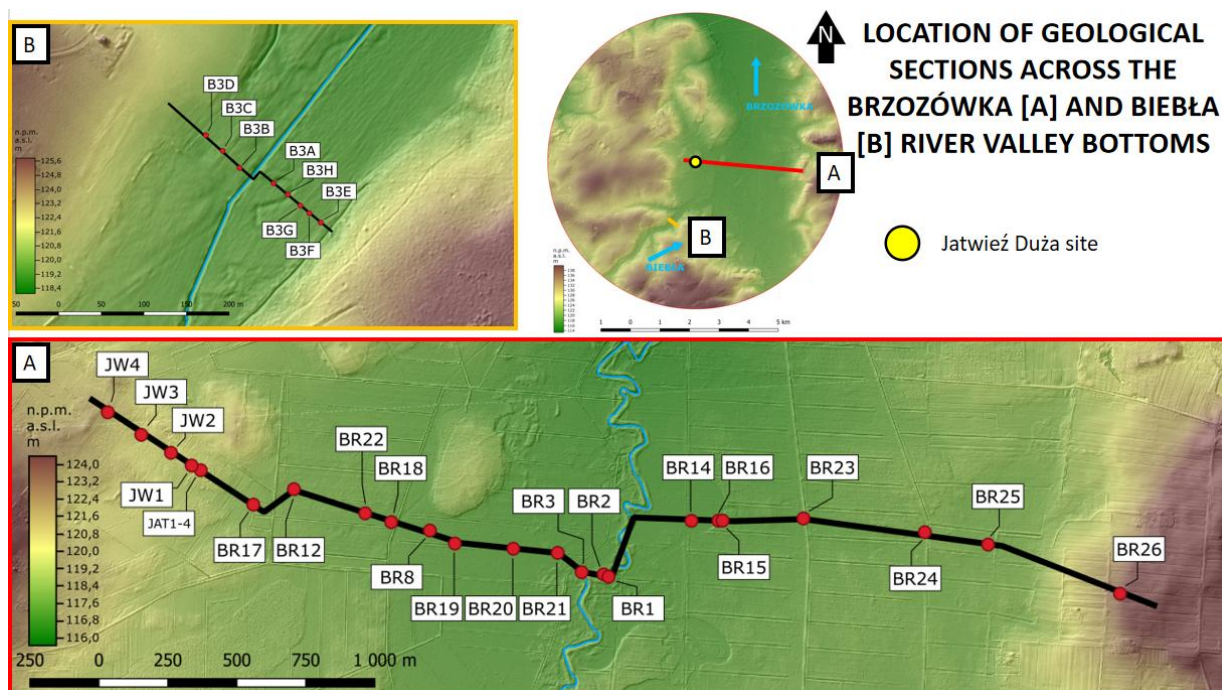


Figure 2 – Location of geological section across the Brzozówka (A) and Biebla (B) river valleys with the locations of geological boreholes marked

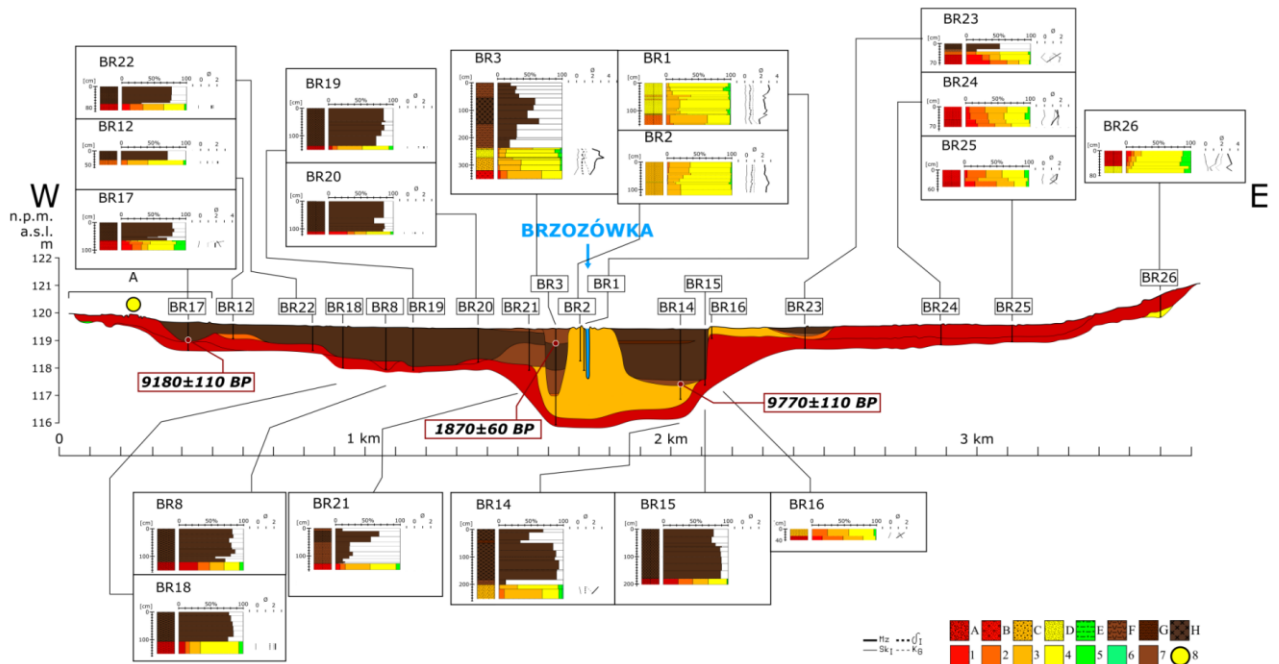


Figure 3 – Schematic geological section across the Biebla river valley

*Lithology:* A – sands with gravels, B – sands with single gravels, C – medium-grained sands, D – fine-grained sands, E – silts and clays, F – sandy peats, G – peaty silt, H – peats; *Fractions:* 1 – gravel (below  $-1\phi$ ), 2 – coarse sand ( $-1-1\phi$ ), 3 – medium sand ( $1-2\phi$ ), 4 – fine sand ( $2-4\phi$ ), 5 – silt ( $4-8\phi$ ), 6 – clay (above  $8\phi$ ), 7 – organic matter, 8 – Jatwież Duża site; Folk-Ward's distribution parameters: Mz – mean diameter,  $\delta_1$  – standard deviation (sorting),  $Sk_1$  – skewness,  $K_G$  – kurtosis

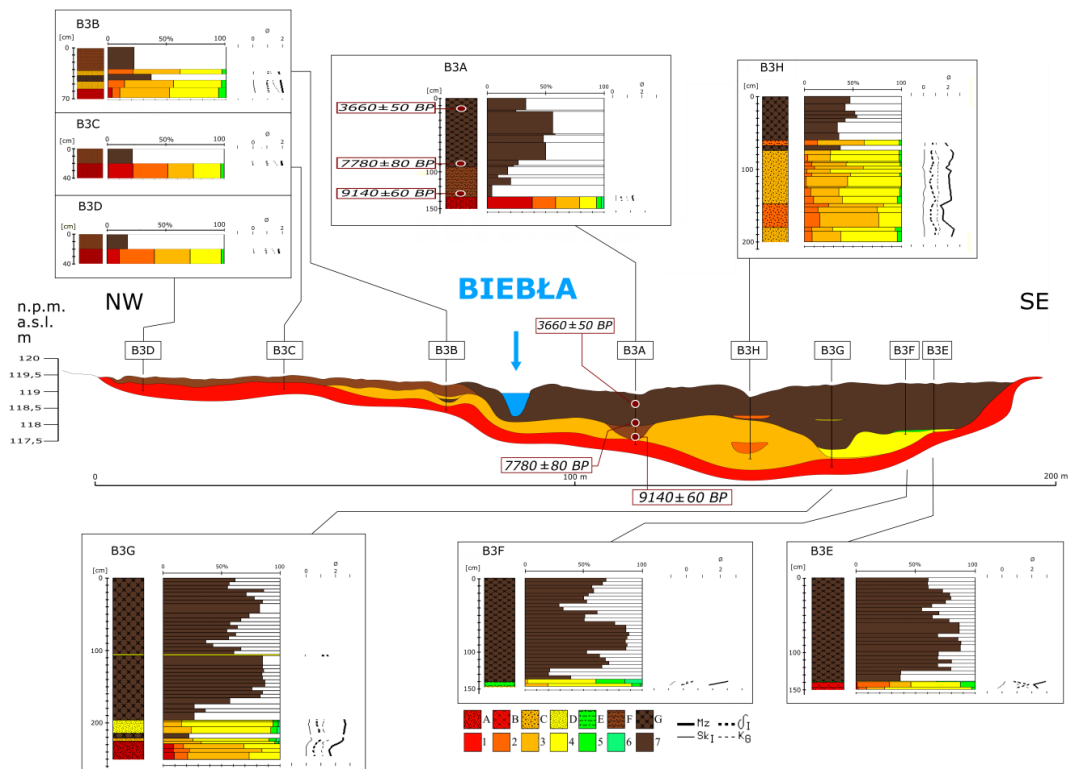


Figure 4 – Schematic geological section across the Biebla valley

*Lithology:* A – sands with gravels, B – sands with single gravels, C – medium-grained sands, D – fine-grained sands, E – silts and clays, F – peaty silts, G – peats; *Fractions:* 1 – gravel (below  $-1\phi$ ), 2 - coarse sand ( $-1-1\phi$ ), 3 – medium sand ( $1-2\phi$ ), 4 – fine sand ( $2-4\phi$ ), 5 – silt ( $4-8\phi$ ), 6 – clay (above  $8\phi$ ), 7 – organic matter; Folk-Ward's distribution parameters: Mz – mean diameter,  $\delta_1$  – standard deviation (sorting),  $Sk_1$  – skewness,  $K_G$  – kurtosis

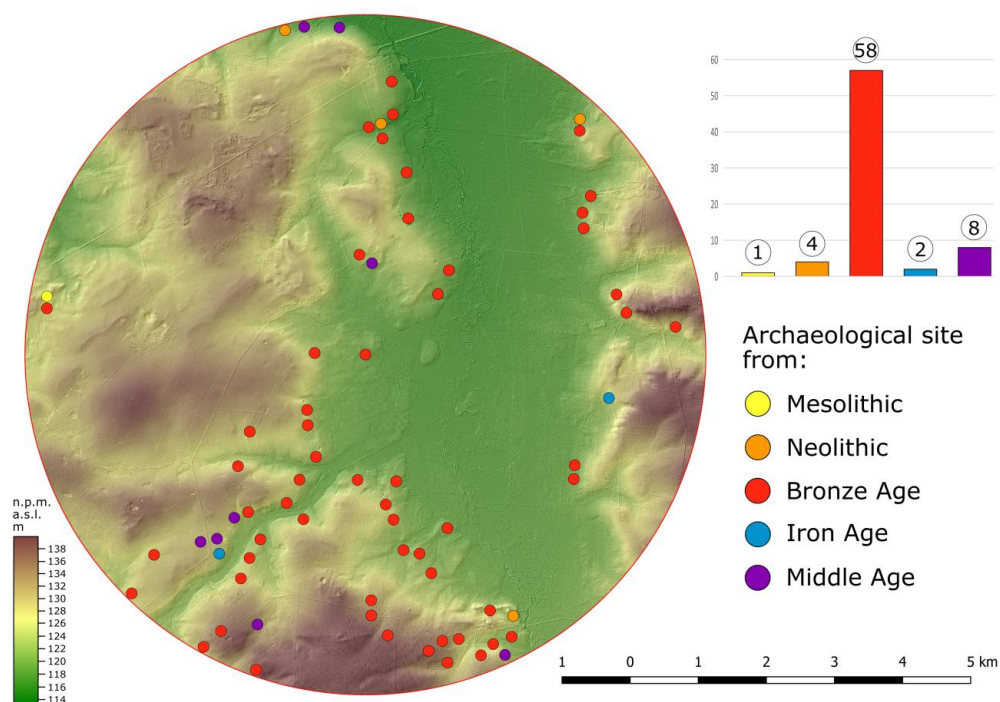


Figure 5 – Archaeological sites in the study area – Jatwież Duża (AMP data)

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