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From a point on the map to a shape in the landscape. Non-invasive verification of medieval ring-forts in Central Poland: Rozprza case study

Jerzy Sikora[a], Piotr Kittel[b] and Piotr Wroniecki[c]

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In the last decades several research projects were undertaken in Poland to verify remnants of medieval ring-forts, and also smaller fortified objects, mostly motte-type structures, which were private residences of the late medieval nobility. The main focus of those projects were issues related to the chronology of strongholds via the study of material culture through excavation. Since the 1990s an attempt to broaden this knowledge with absolute dating acquired by dendrochronological analysis supplemented by the 14C method provided detailed dates of many rampart features. As a result, ring-forts or mottes were understood as dots on maps, detached from their landscape contexts, attempting to illustrate mutual synchronic processes of establishment, operation and destruction in specific chronological horizons. They were used to support a number of historical theories, such as the development of pre-state (so called "tribal") territorial organization, development of the early Piast monarchy, transformation of the administrative network of the monarchy (e.g., Kara 2009), as well as the development of a network of private residences of the nobility from the mid-13th century on.

In 2013 and 2014, a research project based on non-invasive verification of ring-forts in the area of Central Poland was conducted. The main difference between this project and former actions was an attempt to implement large-scale, solely non-invasive and geomorphological surveys, in order to explain broader environmental and spatial intra-site and landscape contexts of the studied ring-forts. A wide variety of methods was implemented, including geophysical (magnetic gradiometry and earth resistance), geochemical (phosphate), aerial archaeology, aerial laser scanning, analytical fieldwalking, topographic survey and geomorphological mapping.

Nine ring-fort complexes have been surveyed to date: Chelmo site 1 (Polish Archaeological Record AZP 81-54/1), Ewinow sites 1, 2, 3 (AZP 62-44/160, 162, 161), Krzepocinek site 1 (AZP 61-48/20), Rękoraj sites 1, 17 (AZP 71-54/1, 18), Rozprza sites 1, 5, 6 (AZP 76-54/13, 6, 14), Spycimierz site 1 (AZP 62-45/74), Stare Skoszewy sites 1, 2 (AZP 64-33/31, 32), Szydlow sites 1, 2 (AZP 66-48/56-57, 62), and Zarnow sites 1, 2, 3 (AZP 77-58/1, 2, 3) (Fig. 1). Earlier work on these sites comprised solely excavations, from regular digging projects by teams of the University of Łódź, Archaeological and Ethnological Museum in Łódź and the Łódź branch of Polish Academy of Sciences to limited test trenches carried out mainly for heritage management reasons.

[a] Department of Historical Archaeology and Weapon Studies, Institute of Archaeology, University of Lodz, Lodz, Poland

[b] Department of Geomorphology and Palaeogeography, Faculty of Geographical Sciences, University of Lodz, Lodz, Poland

[c] Independent researcher, Warsaw, Poland

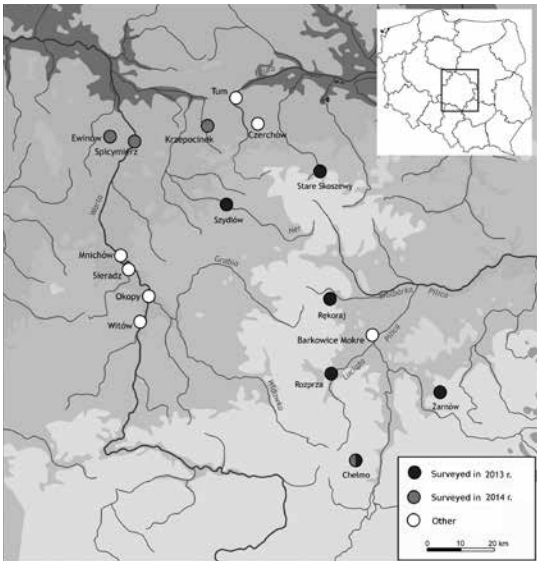

Fig. 1. Map of early medieval ring-forts in Central Poland

The results from Rozprza, a site situated approximately 60 km south of Łódź in the middle of the Luciąża river valley, have so far been a prime example and case study of the new types of information that such non-invasive approaches may bring forth.

The Rozprza ring-fort settlement complex functioned as a "tribal" centre from the second half of the 9th century to the middle of the 10th century AD. From the 10th to the 13th century, it played an important role in the Polish state as a local administration unit. In the second half of the 13th century, it was the seat of a local officer (*castellanus*), and in the 14th century it became the seat of a noble family. In the early Middle Ages, Rozprza was one of the most important medieval strongholds in Central Poland. Remains of the ring-fort defensive system are poorly preserved, but still visible in the field as earthworks. Currently, the site occupies an area covered by meadows and fields, located between the main channel of the Luciąża and Rajska rivers (the latter is a secondary channel of the Luciąża river system) in the central part of the river valley, on the Plenivistulian residual terrace adjoining the Late Vistulian and Holocene floodplain.

Ongoing non-destructive surveys of the ring-fort surroundings have included diverse prospection methods integrated in a GIS environment. The data already collected have provided useful information for a reconstruction of the spatial structure of the ring-fort and surrounding settlement, as well as elements of the natural environment.

Geophysical prospection (Fig. 3) revealed the presence of several strong linear magnetic anomalies, which can be interpreted as sub-fossil palaeochannels of the Luciąża river (evidenced also in aerial images, Fig. 2). Earth resistance prospection revealed the presence of anomalies around the ring-fort earthworks, recognized as traces of previously unnoticed moats and ramparts. Very narrow, linear magnetic anomalies intersecting the large palaeochannel were

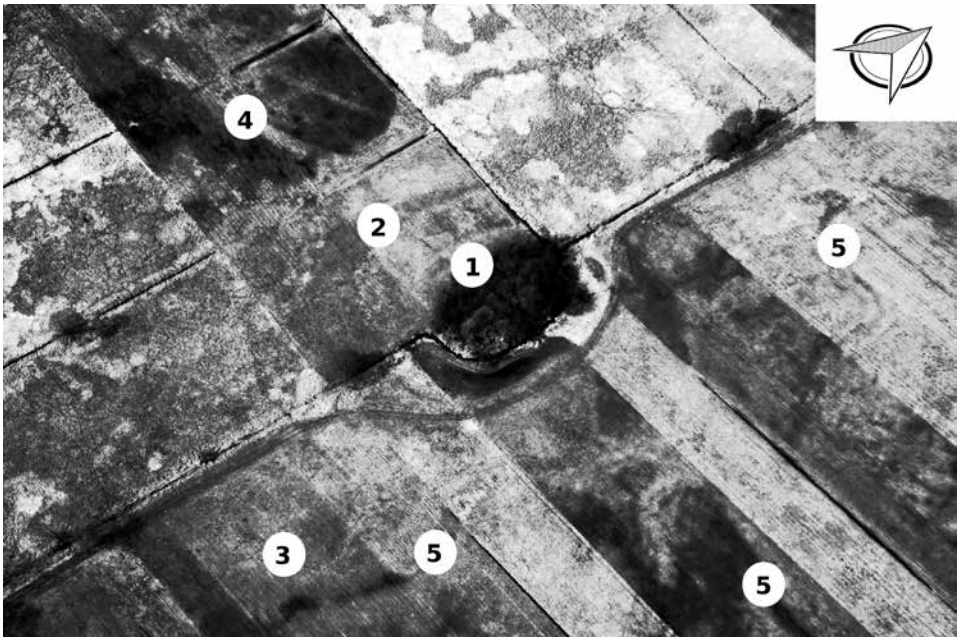

Fig. 2. Aerial photo of the ring-fort area in Rozprza (Photo: W. Stępień, 2013). Legend: 1 – remains of the ring-fort; 2 – outer rampart; 3 – second bailey; 4 – possible causeway; 5 – sub-fossil palaeochannels

registered in the western part of the study area; they were also visible in aerial images as crop marks. Based on geological soundings and the spatial orientation toward the ring-fort earthworks, this feature has been interpreted as a possible bridge or causeway.

Fieldwalking around the ring-fort revealed a large number of potsherds from early and late medieval times in the area of the presumed defensive structures and near a small hillock, which had been identified as an open settlement (Chmielowska 1966). The phosphate survey has also shown a higher level of phosphorus in the ground in the area of the ring-fort and hillock only. However, the relatively low levels of phosphorus could be the effect of specific wetland area conditions.

The geological survey confirmed the existence of moats filled with organic (gyttja and peat) and partly inorganic deposits with abundant remains of wood. The results correspond to various geophysical anomalies and features recorded in earlier archaeological research. The radiocarbon dating of organic materials from the moat fill confirmed the existence of a moat system as early as the 9th and 10th century.

The survey confirmed the highly favorable, naturally defensive conditions of the area (swamps, natural ground obstacles). The geophysical and aerial record of the ring-fort remains gave an entirely new view of the monument with the ring-fort being protected by concentric walls and moats and an additional bailey, probably surrounded by separate fortifications from the south. A road accessed the ring-fort from the west and southwest. A single open settlement was located on the eastern side, on a nearby hillock.

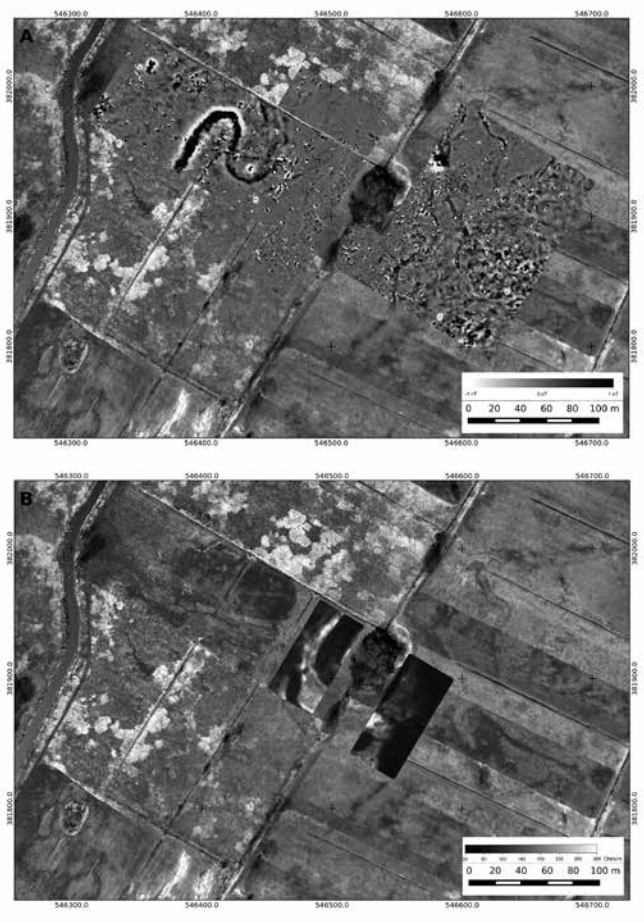

Fig. 3. Results of the geophysical survey in Rozprza (background: orthophotomap based on aerial pictures by W. Stępień); A – magnetic prospection; B – earth resistance prospection

The Rozprza survey is an interesting case study, illustrating in empirical terms the ups and downs of various approaches in archaeology. The ring-fort may now be recognised as a series of structures embedded within a wetland setting, with open settlements, road systems and impressive defensive features showing a much more informed view of man's attempt at mastering a unhospitable landscape. This was possible for the most part thanks to the application of multi-method non-destructive prospection.

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