

Archaeological excavation and GPR prospection in delineating defensive embankments on Ostrów Tumski (Cathedral Island) in Wrocław (Lower Silesia, Poland)

Aleksander Limisiewicz^a, Aleksandra Pankiewicz^b and Adam Szynekiewicz^c

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Several islands existed in the Oder river valley at a point where five small tributaries joined the main river, on the spot of present-day Wrocław. A convenient river crossing at this location fostered settlement on the islands. In modern times, particularly in the 17th and 18th centuries, sophisticated fortification systems were constructed, resulting in the backfilling of the broads. Urban development began in the 19th century. The preferred site for settlement was Ostrów Tumski (Cathedral Island). A stronghold was built there in the first half of the 10th century and within its walls a church and later Cathedral.

Archaeological excavations have been carried out on Tum Cathedral Island for almost 100 years. The data have been used to build a number of models of the architecture and fortifications (timber-and-earth embankments), but researchers are not agreed on the exact location and evolution of these defenses. Excavations between streets Kanonia, Kapitulna, St. Idzi and Katedralna uncovered remains of timber-and-earth defensive embankments in three places (Fig. 1). Beams making up the substructure were reinforced with hooks in the faces (Fig. 1: A, B, C). They were set in pairs, the beams slightly more than 1 m apart, the paired beams spanning a distance of 1.8 m to 2.5 m. Logs 30 cm in diameter, from 3 m to 6 m long, were placed lengthwise, supported on the hooks. Parallel to the outer face of the rampart marked by the logs, at a distance of 2.8 m, a row of wooden battens, rectangular in section and measuring 15 cm by 6–7 cm, were driven into the ground. They formed an openwork wall, possibly plaited together above eyelevel. Cut logs about

^a AKME Zdzisław Wiśniewski, Wrocław, Poland

^b Institute of Archaeology, University of Wrocław, Poland

^c KART-GEO, Wrocław, Poland

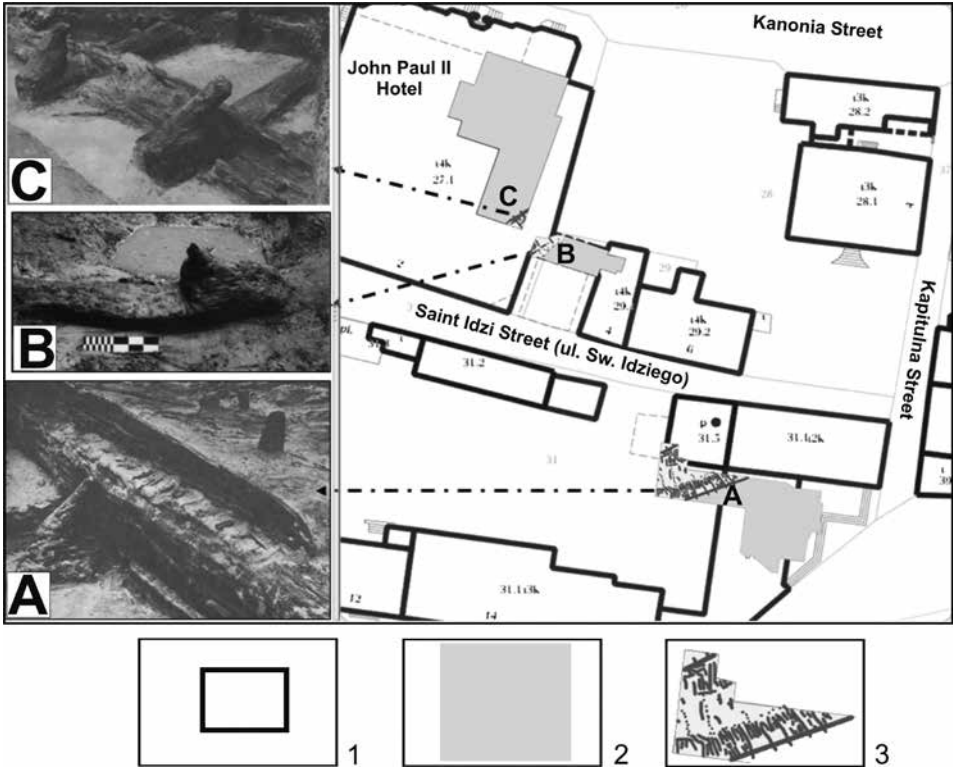


Fig. 1. Ostrów Tumski (Cathedral Island) in Wrocław. Relics of medieval defensive embankments seen in the archaeological trenches. 1) extant buildings; 2) archaeological trenches; 3) medieval defensive embankments in the trenches: A – wooden structures at the base of the southern embankment; B – wooden structures on the inner side of the northern embankment; C – wooden structures on the outside of the northern embankment

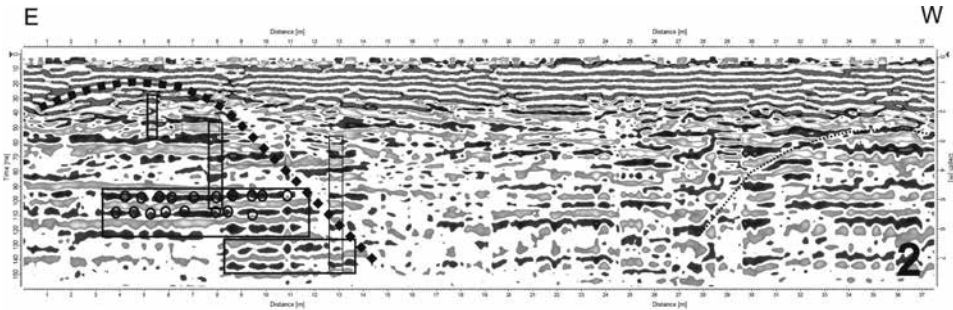


Fig. 2. GPR cross-section through the island: 2. Interpretation: dotted line – embankment, rectangle – wooden structures, circles – echo of wooden beams in the embankment

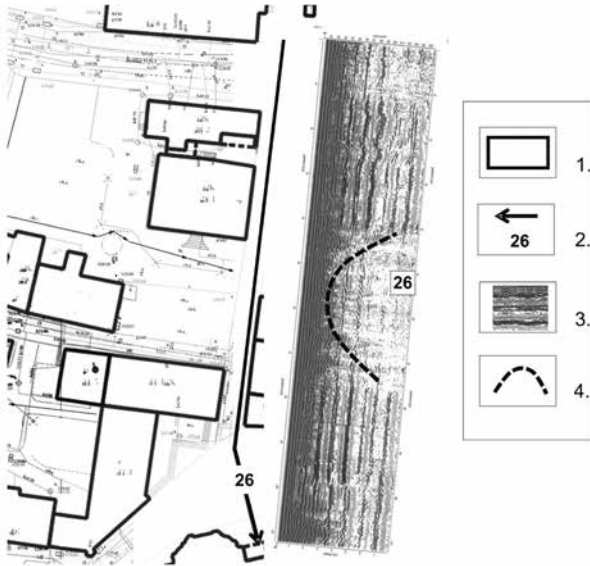


Fig. 3. Example of a GPR section (26), showing the structure of the timber-and-earth embankment.
 1) extant buildings outlined on the city map; 2) location of the given GPR cross-section on a map of the city; 3) GPR cross-section; 4) timber-and-earth embankment



Fig. 4. Section of the city map showing Ostrów Tumski (Cathedral Island) in Wrocław. Outline of one of the medieval timber-and-earth embankments from the first half of the tenth century, projected on the basis of archaeological and GPR research. 1) extant buildings; 2) archaeological trenches; 3) relics of medieval defensive embankments in the archaeological trenches; 4) location of individual GPR cross-sections and their numbers; 5) location of timber-and-earth structures on the GPR cross-section; 6) projected outline of timber-and-earth embankment

1.5 m long were placed crosswise in the intervening space, the first layer alongside the openwork wall, the free space to the rampart filled with a layer of sand. In the next layer, the wooden logs were placed over the sand, resting against the long logs in the face of the rampart. This arrangement was repeated, raising the structure. The core of the embankment was filled with sand. Inside, there were vertical logs crosswise and lengthwise, as if framing empty chambers. A flat foreground 4 m wide was formed in front of the embankment; it then dropped almost a meter to the edge of a ditch (moat?) reinforced with pegs and fascine. Dendrochronological analysis of the hook beams from the substructure indicated that the timber came from trees felled not later than in 940.

A GPR survey was carried out between the trenches. The sections were located in the area of the excavated embankments, avoiding relics of prewar architecture and engineering infrastructure, and tree roots wherever possible. A RAMAC/GPR apparatus with 250 MHz shielded antennas was used for the prospection. The data were collected for a depth of 8 m underground, supplying information on the geological structure. The timber-and-earth embankment was recognized in a few places of the GPR sections, including wooden structures and in places also the beams in the rampart core (Figs 2, 3). The GPR results were mapped and analyzed together with the results of the excavations to project the line of the defenses. Since it proved impossible more often than not to connect the parts of the embankment detected in individual GPR sections, it was assumed that the relics represented a number of independent rings of defenses, possibly from different periods in the development of settlement on the island and possibly not interconnected. Indeed, the ramparts could have been superimposed.

The present article concentrates on tracing the line of only one of the embankments (Fig. 4), contributing to a new image of the early defenses surrounding Wrocław's Cathedral Island.