

Archaeological Prospection from the Air in the District around the Open Mining of the Cologne Basin in Northrheinwestfalia/Germany

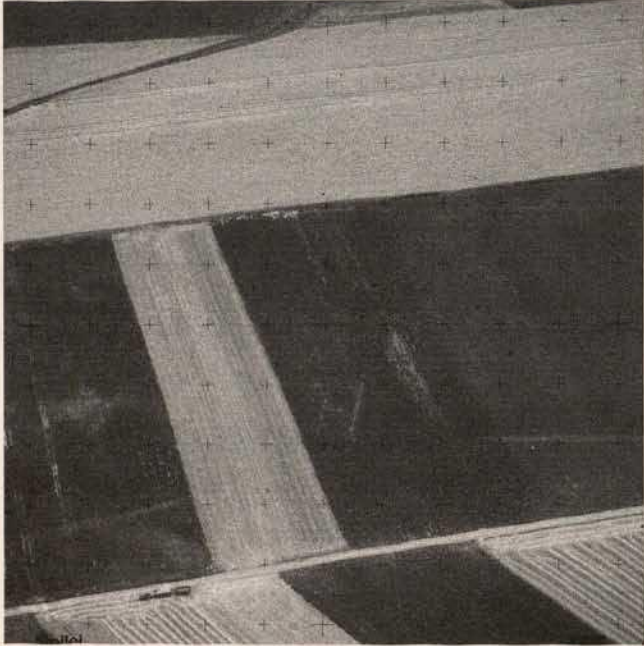


Fig. 1. Crop marks of Roman villa and way from 18th century in July near Inden (A03286/MSBD848 LVR/RAB/Zantopp, R.)

To work successfully in archaeology in the open mining district of Cologne Basin it is necessary to get knowledge as far as possible of what you will see under the surface when digging into the ground.

This knowledge comes by archaeological prospection with the special science disciplines of geophysical measurements, geochemical proofs, geoarchaeological drillings, surface scans and last but not least aerial archaeology.

This remote sensing method since 1960 systematically at work in the 14,400 km² wide Rhineland area of Germany.

To focus this method specially in the three open-mine areas of the Cologne Basin a special project was set up running for over one year, financed by the Foundation "Stiftung Archäologie im Rheinischen Braunkohlenrevier".

A main focus of this project was to test the abilities of vertical and oblique photos in connection with colour-infrared film material.

This paper describes the project-aims, work and results illustrated with a few aerial photographs, plots and digital orthophotos of findings and brings out what changes in aerial archaeology in the whole Rhineland area are initiated by this project.

The following figures will illustrate the workflow from aerial archaeology findings to excavation of an Roman villa in the "Inden" mining district.

Fig. 2. Orthophotomap from the site to prepare further research

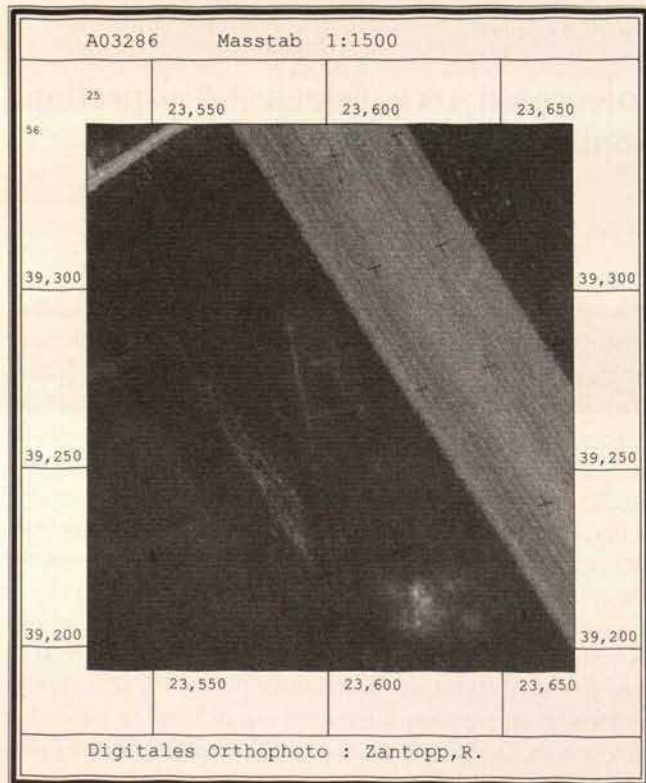


Fig. 3. Excavation on the site short before cole-mining comes (A03286/MSBE95 LVR/RAB/Zantopp, R.)



M. Zupancic, D. Najdovski

Decoding an Invisible Late Roman Inscription using GPR imaging and EM modeling

In a late Roman city wall of Celje in Slovenia there is, among other secondarily used stone material, a block with a Roman inscription. A part of an inscription is visible. The other part is hidden.

A preservation ethics indicates a nondestructive approach, used by the authors.

To read a hidden part of an inscription we used electromagnetic (EM) modeling for Ground Penetrating Radar (GPR) imaging with a Finite Difference Time Domain modeling (FDTD).

The purpose of our experimental and modeling efforts is to achieve a pre-processed data base for 3D image reconstruction algorithm.

We present a rendering in three-dimensions with high resolution detail visualization.

Keywords: 3D FDTD EM modeling, GPR, 3D radar imaging, visualization.