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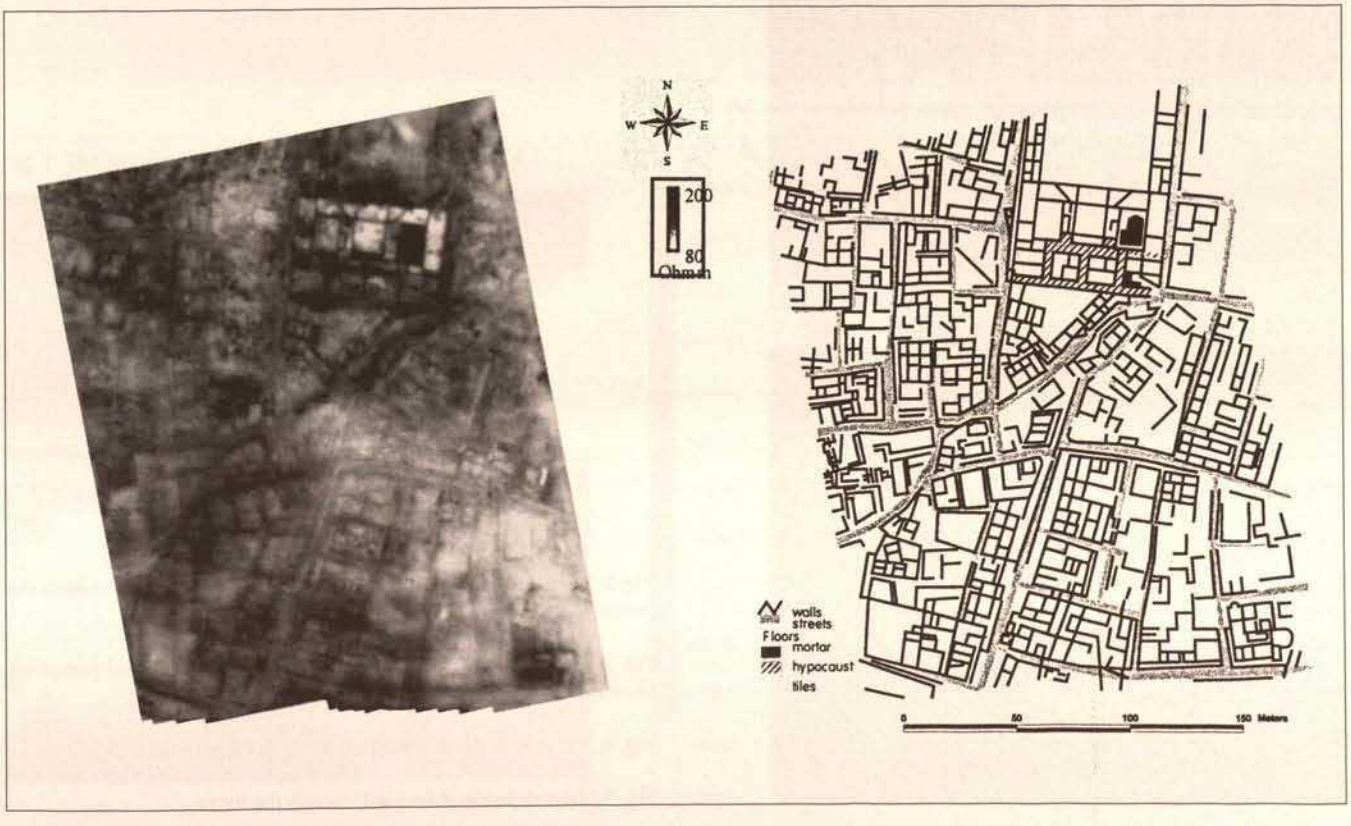
Computer Aided Virtual Reality Reconstruction Based on Prospection Data An Example from the Roman Town Carnuntum/Austria

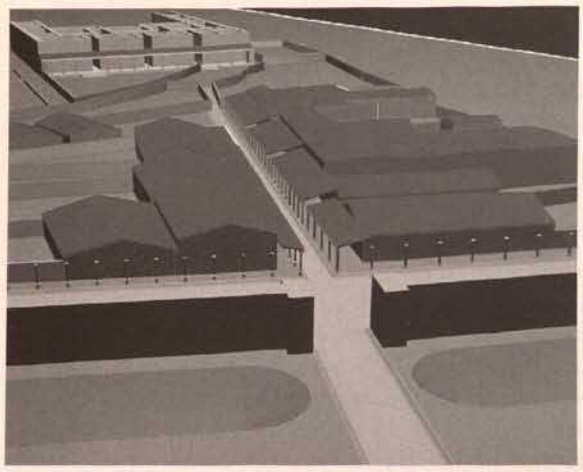
To demonstrate the potential of archaeological prospection data, computer aided reconstruction is used to illustrate the archaeological interpretation of a part of the Roman civil town Carnuntum east of Vienna. This part is mainly known from data collected during the last three years by an integrated prospection approach combining aerial archaeology, geomagnetics, resisitivity mapping and GPR. By combining archaeological knowledge with architectural construction techniques from the Roman period we try to derive virtual reality scenes that can be shown to a wider audience to illustrate a reconstructed scenario of archaeological sites not yet excavated. By using software for architectural modelling as well as desktop virtual reality techniques we create virtual walkthroughs of the Roman civil town of Carnuntum/Austria.

The computer aided reconstruction has been performed with modern architectural software as well as some general purpose modelling tools that are especially suited to generate complex forms like in the Roman period. Furthermore existing three dimensional libraries of Roman architectural art helped to create realistic virtual scenes inside the computer. To manage the data complexity of a realistic visualisation for a part of an entire town several methods for data reduction and data abstraction have been used to produce visual appealing results, although the amount of data had to be reduced drastically. The computer based reconstruction is a combination of threedimensional architectural models as well as plausibel definition of materials from the roman time. The base for the reconstructed buildings have been derived from the evaluated geophysical prospection by archaeological interpretation carried out by archaeologists. The heigth of the buildings have been estimated with archaeological aid from the prospected floor plan and the measured wall thickness. The shapes of the buildings have been reconstructed using the floor plan again and additional knowledge from already excavated buildings at the same site.

The archaelogical reconstruction visualizes a large area of about 8 ha. The virtual walkthrough starts from outside the town from the necropolis situated aside the main road leading into town from the south. By passing the town wall with the fortification ditch in front we enter the town still on the main road. We pass several houses (shops, housing areas, workshops), a temple and enter a large public building at the southern end of the forum. After crossing the forum the walk leads through a basilica to a monumental public bath.

Fig. 1. Resistivity survey of a part of the Roman civil town of Carnuntum with archaeological interpretation map; RM15 twin array 0.5 m, raster 0.5 x 0.5 m, area 5 ha





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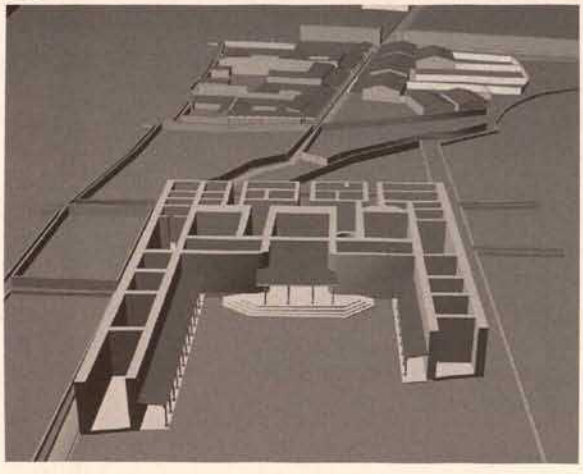

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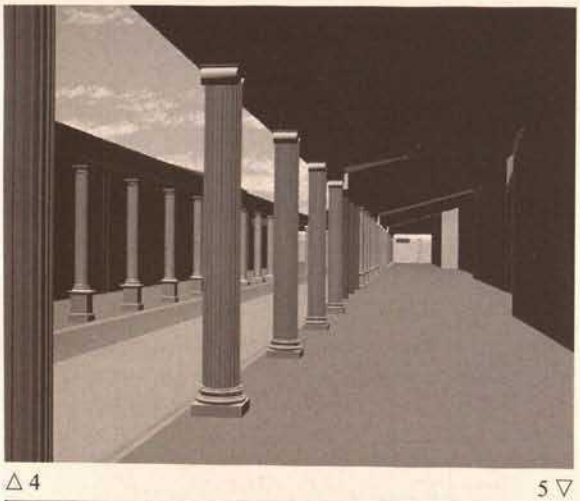

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The computer aided reconstruction is a fast and cost effective way to present the archaeological interpretation model derived from prospection data to a wider audience. Computer aided reconstruction of archaeological sites provides a wide base for discussion in archaeology still giving the chance of dynamic development of the scene which is a major advantage compared to conventional reconstruction.

Fig. 2. View from outside the town on the main road leading towards the forum

Fig. 3. View from north (above the forum) towards a selected part of the town along the main road

Fig. 4. View from inside a portikus along the main road

Fig. 5. View from the main road towards the forum