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A Virtual Journey through Roman Settlement : Aloria

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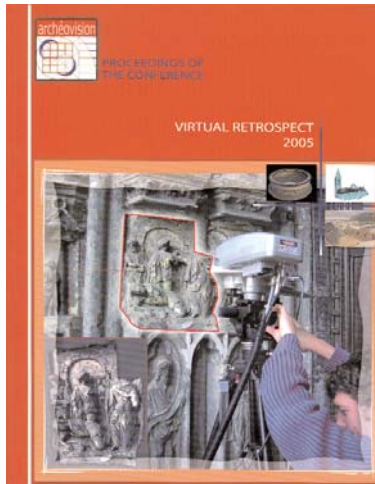
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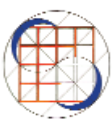
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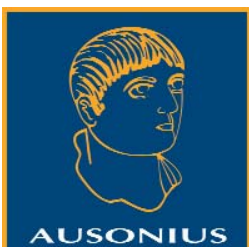
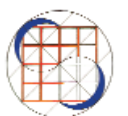
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A VIRTUAL JOURNEY THROUGH A ROMAN SETTLEMENT: ALORIA

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Abstract : This article presents the virtual reconstruction of a portion of a Roman Settlement found in Aloria (Alava – Spain). Such reconstruction was carried out using the 3DMAX program. The purpose of the reconstruction is to serve as a graphic base for the ultimate publishing of the theses of the excavation, the monographic exhibition about such settlement that will be soon held at the Archaeological Museum of Alava, as well as the making of a video for the exhibition and its subsequent visualization on the net. It is this latter part, the visualization of the reconstruction on the net using the WRML format at <http://tempus3d.com>, that this article is about.

Keywords : virtual reality — virtual archaeology — WRML/VRML — reconstruction — education — Roman villa. 3D modelling.

The virtual reconstruction of archaeological settlements is lately becoming the easiest and most attractive method of transmitting the results of archaeological interventions to the general public because they are easily understood by everybody. On the other hand, the process of virtual reconstruction of any settlement leads to new questions about the liberalization, limitations, etc, that archaeologists till now were not used to answering, making the analysis of the encountered structures deeper.

The reconstruction of the Roman settlement of Aloria has a special relevance given the fact that it has been over, thus making it impossible to be visited anymore.

The Roman settlement of Aloria is located in the Orduña valley (fig. 1), where the Nervion river takes its source and which has always been used as a communication route between the Alavan plains and the Cantabric Sea. As proof of its importance as a crossroads Orduña was where the customs house was situated for centuries because most of the merchandise coming from Castilla had to pass through this strategic spot.

We clearly found three phases of occupancy, all of them dating



Fig. 1: Aloria's location.

from the Roman period (fig. 2). In the beginning, in the early 1st century A.D., five enclosures were built. During the second phase of the settlement, around mid 2nd century A.D., two of the enclosures were enlarged with tiled roofs, one of which led to a cesspool built with a restraining wall, creating a sort of *impluvium*. A sewer was also built to carry the water from the *impluvium*. Besides, four new enclosures were built, three of them were attached to the previous five, and the streets were paved. The last phase took place during the early 4th century AD. The enclosures built up till then were falling into disuse and in ruin so a new one was built apparently performing the same functions as the previous ones.

The remains found in Aloria seem to be the stables, warehouses and workshops of a small villa. Such a villa must have been placed a few metres uphill. However the extraction of soil from the place where the *villa* supposedly was, only left a large amount of debris all over the area. Out of the enclosures found in Aloria, none of them is a dwelling in itself.

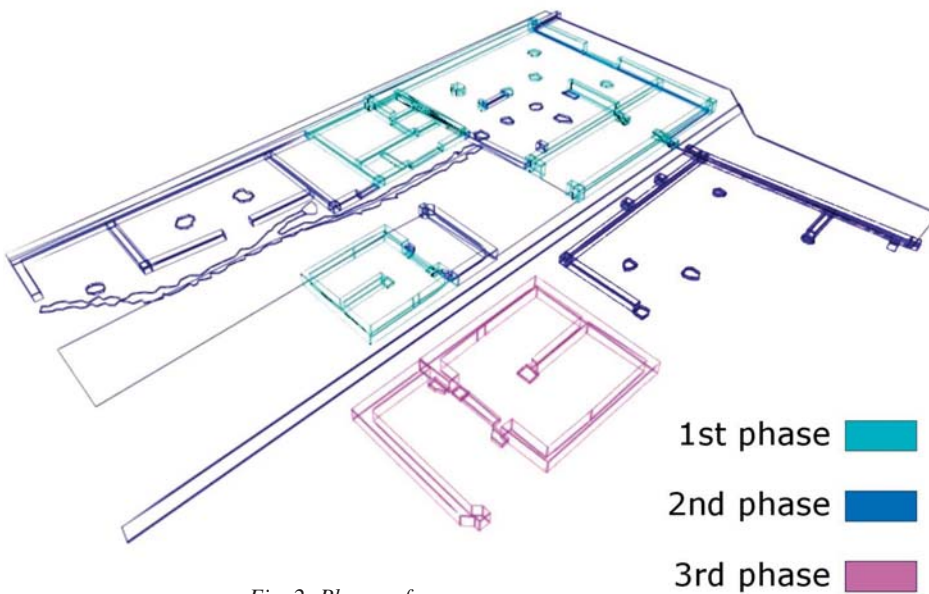


Fig. 2: Phases of occupancy.



Fig. 3: General plan of Aloria.

There are two stables, two warehouses, one forge, some attached tiled roofs and a barn built in late Empire period. The remains of cows are numerous, as well as those of horses buried in one piece. There are also many slag heaps as a result of a secondary treatment of metal in the forge. So far no remains have been found to make us think of a first transformation of iron in Aloria, basically because the ovens found were designed to work the metal, probably imported, and were not foundry ovens themselves. Besides this, there are no veins nearby and there are not any foundry slags either. The virtual journey in WRML is just a part of the graphic documentation and virtual reconstruction carried out in this settlement. The virtual reconstruction and the drawing of the plans (fig. 3) were possible thanks to the help and financing received from the Basque Society of Studies. Such reconstruction has several goals, one of them being the recreation of this virtual journey and its consequent release through the web. The reconstruction will also be used as illustrations in the theses of the excavation and also in the monographic exhibition about the Aloria settlement that will be inaugurated in the coming future at the Archaeological Museum of Alava (fig. 4, 5 & 6). This exhibition will show a brief video focused on the 3D reconstruction of the hypothetical appearance of the buildings. The three phases previously mentioned, 1st, 2nd and 4th century AD, are explained thoroughly in the video.

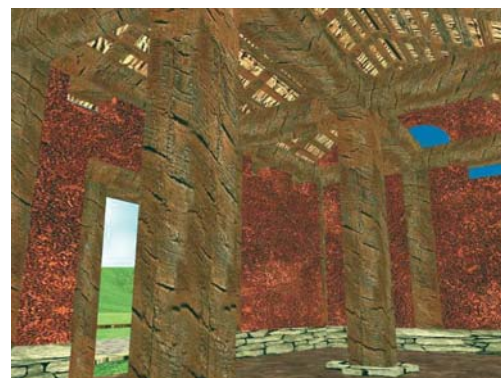


Fig. 4: Inside the warehouse.



Fig. 5: General view.



Fig. 6: Enclosures M, W, Y.

The planimetric drawing of the settlement was recreated by recording the surface on video and then it was digitized. Afterwards, with the help of a topographic plan and applying the Airphoto program a photo mosaic was created in order to faithfully represent the structures and trace them.

The recreation of the 3D reconstruction was entirely done with the 3D Max program (fig. 7). Then it was exported as WRML to be visualized on the web. The 3D program is also used in the videos and illustrations of the exhibition at the Archaeological Museum of Alava and in the theses of the Excavation (fig. 8).

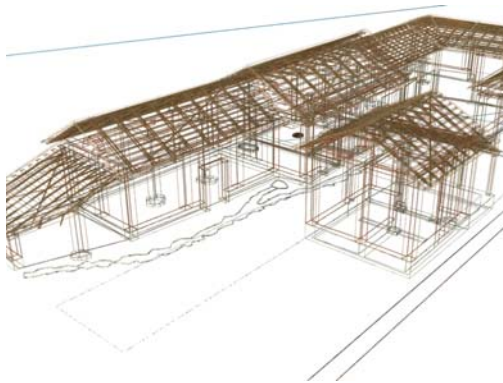


Fig. 7: Modelling the reconstruction.

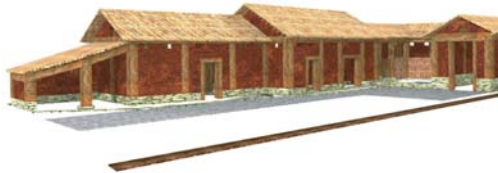


Fig. 8: Enclosures M, W, Y, in the theses of the excavation.

The WRML virtual journey can be found on the web at: <http://www.tempus3D.com>, this journey is the 2nd phase of the settlement, 2nd century A.D., the largest of the three.

First the geographical environment of the settlement was created (fig. 9). To do so, the Orduña valley was 3 dimensionally modelled using the contour lines taken from the army topographic service map, scale 1:25,000, with a 20 metre equidistant between the curves.

Once the topographic environment was finished the structures were created (fig. 10). This is what you will find at the Internet address cited above. The virtual journey allows visitors to wander around by themselves or through a pre-determined path, following previously fixed points of view. Visitors can walk off the predefined path anytime to look around by themselves with the choice of going back to the journey at any point.

The use of this kind of constructions is nowadays unquestionable, for it enables the general audience to be attracted to and understand the archeological findings which, otherwise, are only accessible to a few experts in the given field. It becomes even more necessary when the

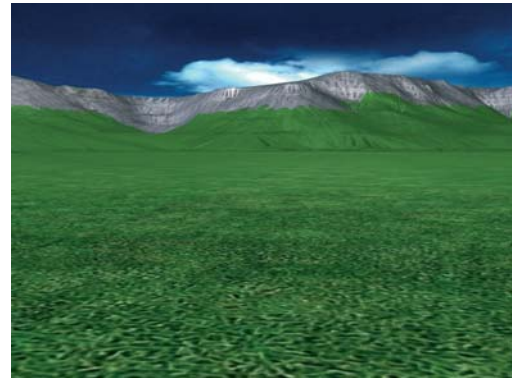


Fig. 9: Geographical environment three dimensionally modelled.



Fig. 10: Final aspect of the virtual reconstruction.

aforementioned findings are currently inaccessible or have disappeared, as it is the case of Aloria. The fact that the audience is able to understand and enjoy the archeological exhibition of a settlement with no flamboyant materials is greatly facilitated by 3D technologies. These design technologies allow for photographic-quality illustrations and videos to be made, as well as free visits to the settlement, which stimulate the curiosity of the visitors.

The WRML format allows us to publish the reconstruction on the web, being thus potentially accessible to a large audience at a low cost. Due to the reduced size of the files, WRML format is widely used on the web. The reduced size of the files comes as a result of the 3D environment reduction, in WRML there are no shadows nor light effects and the textures must be flat (2 dimensional) photographs. To sum up, WRML format provides us with a wide and cheap broadcast medium though brings with it a great loss in quality. The connections to the net and the zipping programs are getting better and better day by day so it will soon be possible to load photorealistic 3D environments on the web and they will be easily accessible to everyone.

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