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Messina 1908: The Invisible City

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Introduction
The initial purposes of this work were to build a 3D model of the old city of Messina and to reconstruct a walk through it; to understand the "Ghost city," the parts that form it, and the rules of its plan, which are explicit in some cases but hidden most of the time; to measure its space, appreciate the similarities to and differences from modern city plans, and use the information to improve the plans of tomorrow.

It might seem a useless study of a nonexistent city, and yet during the months of detailed work, of patient reconstruction from the surveys and photographs of the city destroyed in 1908, we began to consider how it was still possible to obtain spatial values of and to project behaviors in the lost city, in other words, to practice tests on memory that are very interesting for people working in a context in which memory no longer exists.

The work presented here is the first stage of a more complex research project still to be carried out on Messina as it was at the end of the nineteenth century. Here we constructed a 3D model of some parts of the city prior to the earthquake of 1908 and made a five-minute video, using cartoon techniques, of an "impossible" walk through the city. The fragments of the city were reconstructed from available documentary sources, primarily photographic images, which tended to be of the most important places in the city.

Methodology and Work Steps
The construction of the model required distinct work phases, which resulted in a correspondent series of products that can be considered autonomously.
First, we began with the digitization of the cadastral pre-earthquake cartography (on the scale of 1 to 1.000), distinguishing, on different layers, the contours of the buildings, the internal cadastral partitions, and, even if not finalized in the construction of the model, the lines of the plan for the reconstruction of the destroyed city. We obtained the city plan by assembling the individual small maps; this was the first step in reconstruction of the volumetry and thus of facades which determine the rebuilt urban scenes. The procedure employed for the acquisition of the cartography, permitted us to give, distinct or superimposed, the cadastral planimetry of the city and/or the planimetry of the reconstruction plan.

The second step was to research sources for the reconstruction of the sizes and layout of the buildings. As the original plots of the projects were missing, we fell back on photographs and illustrated postcards of the era. Those were, of course, devoted primarily to the important places of the city at that time. Most of the images came from the Regional Library of Messina, and others came from the historical archives of the Commune of Messina and from private collections.

Unfortunately, though, there were few buildings (and above all urban contexts) that we could redesign accurately and rich in detail. Furthermore, along the most important road networks, the images show the buildings greatly foreshortened and often permit only an approximate reconstruction of the volumes.

The third step was the reconstruction from the photographic images of layouts and volumes. The facade tracings were reconstructed at a scale of I to 50- To reconstruct the 3D facades on the computer, we needed some graphic libraries. This led to an analysis of the architectonic elements, through a study of the recurrent elements. We thus arrived at a sort of collection of the typologies of the elements making up the facades; this collection can be considered an essential dictionary’ of the elementary forms of the architecture in eighteenth-century Messina.

It is important to point out that it there was a problem of simplification in the building of the 3D models. This resulted as much from technical constraints and from the limits of available means as from the aims for which the complete model was constructed. The simplification and schematizations we built into the design of the elements of the graphic libraries allowed and guaranteed a uniform approximation of each facade and of the rebuilt urban areas.

The next step of the task was the construction of the building facades using, and adapting when necessary, the various elements of the dictionary. All the work relating to every building whose facade was redesigned was set out on index cards; each one giving the elements of the cadastral identification, a
synthetic description taken from texts of the time, the relevant bibliographic indications, two reproductions of some documentary photos, the a view at the scale 1:200, and the images of the model in 3D of the facade. At the same time, we designed the volumes of the model. Finally, all the facades that it was possible to redesign were inserted into the wire frame model.

At this time part of the 'invisible city was rebuilt, and we began to choose the routes, to illuminate several of the scenes, and to assign colors to the individual buildings. This set the stage for the animated walk through the city. The completed video shows a walk through the model on a route that starts at the railway station and crosses the most important squares of the time, which were completely different from those of today. We produced about 1400 images in succession for the walk. The individual views were processed with a 35 mm single-shot movie camera and then transferred to videotape.

**Conclusion**

We consider this a work in progress, and at this stage it is incomplete in both appearance and in structural and technical characteristics. The finished model is susceptible to further definition and development, in addition to improvements in its formal qualities, utilizing instruments more sophisticated than those we have used so far.

But above all we want to consider this an open work because of the several conjectures that it suggests to us, even if sometimes in a problematic way. For instance, a further elaboration could be the building of a database for the separate cadastral units, so that we could have an interactive system with numerous reports of increasing complexity: from the elaboration of a thematic map, up to graphic and alpha-numeric index cards for separate buildings and groups of monuments, to the cataloging and documentation of the artistic objects contained in the better ones, to the bibliographic connections and documentary sources.

Upon reflection, we also had the idea of setting up and creating a "laboratory museum" of urban history. It would be an institutional structure that could produce material simulating the set up condition, the place, and the monuments of the city at different times. It is an idea we think particularly efficacious above all in a situation like that of Messina, which today has virtually no tangible signs of its history.
Figure 1 Plan for rebuilding
Figure 2  Different elements of the abacus
Figure 6  Perspective

Technical Notes:
Photos and images of the archives utilized: 106.
Redesigned facades: 10
Amount of data: 3D model: 45 Mb;
animation: 350 Mb. Computation time (on Compaq 386/25): 200 hours
Hardware: Compaq 386/25, (80387, 4Mb RAM); IBM AT, (Intel Inboard386/16, 80387, 1.6 Mb RAM); Graphics boards: IBM PGA, Artist 12 CT, EGA, VGA
Software: Autocad (release 9.0), Autoshade (release 1.0), and Autoflix (release 1.0), from Autodesk Inc.