

VIA GEORGOFILII MAY, 27 1993: A TESTIMONY

Antonio Arrighi
Person in Charge of Photogrammetric Department
Military Geographic Institute, Florence-Italy

Commission V, Working Group 4

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ABSTRACT:

I.G.M.I. surveyed the Pulci tower and its surrounding area in order to document the material consequences of the attack on May, 27 1993 in Via Georgofili. A three-dimensional numerical photogrammetric survey of the area was made. Several 3D views were obtained. The simulated models correspond to assonometric and prospective representations of fixed conditions of observation, illumination, time and position of the surveyed area. The complete work is represented in the attached images.

1. FOREWORD

The Italian Military Geographic Institute (I.G.M.I), the Land National Mapping Agency, is the only state institution which is still situated in Florence.

The reasons for its presence, lasting more than 130 years, cannot be considered accidental.

The ties which have deeply-rooted I.G.M.I. in Florentine cultural traditions are represented by those scientific, professional and human values that make the activity of the "Institute" similar to the expression of one of Florence's vocations: the discovery and knowledge of civilizations and peoples by means of creating always new artistic, economic, technical and scientific relationships.

Therefore, it is with deep feeling of communion that I.G.M.I. has witnessed the happy and unhappy events which concern its city.

For this reason, "the Geographic Institute" has shown solidarity towards Florence for the destructive foul deed which happened on the night of May, 27 1993 in Via Georgofili.

Through sophisticated electronic instruments, the technicians of the I.G.M.I.-Photogrammetric Department, with generous and passionate dedication, have prepared an original documentation of digital images which, according to graphic models which have been photogrammetrically digitized and interactively elaborated, represent the destruction caused by that terrible attack.

I.G.M.I.'s technicians have confirmed their professional quality of "excellence" by providing a civil answer to the barbaric action which has wounded not only the Florentines, but all the people of the world.

2. INTRODUCTION

I.G.M.I. surveyed the Pulci tower and its surrounding area in order to document the material consequences of the attack on May, 27 1993 in Via Georgofili.

The explosion on that night, which killed five innocent lives, severely hit Florence's cultural patrimony: the Uffizi gallery's building structures and the precious exposed work of arts were heavily damaged; Saint Stephen's Church on the bridge was heavily hit at its apse; the Pulci tower, at the centre of the Georgofili Academy, was almost totally destroyed together with the innumerable books inside, numbering more than 40,000 volumes which were of enormous historical and scientific value and were mostly unique in Italy.

The technicians of I.G.M.I.'s-Photogrammetric Department have provided evidence of the consequences of the barbaric action, which hit the heart of town, by preparing an original technical documentation to serve as a memorial in the future.

3. A BRIEF HISTORY ABOUT THE "GEORGOFILII" ACADEMY

The "Georgofili" Academy, a symbol of Italian agricultural culture, is more than 200 years old.

It was founded in Florence in 1753 by Ubaldo Montelatici, a devout Christian Lateran, in order to promote better exploitation of the land in Tuscany.

Since 1865-1870, when Florence was the Italian Capital, the Georgofili Academy (also known as "friends of agriculture academy") increased its sphere of action from regional to national areas, becoming the first Italian agronomical centre.

Since those years, its interests extended from the field of cultivating techniques to that of agrarian and economical politics, from applied natural sciences to social problems, conforming its goals through time.

Among the innumerable initiatives that the Academy has promoted in nearly two and half centuries, the followings merit to be mentioned:

- research of more rational techniques for exploiting agricultural land;
- experimental cultivation of new vegetable species;
- intensive introduction of agricultural mechanization;
- the realization of hydraulic drainage projects in the Maremma and Chiana valleys;
- repeated commitment to guarantying more reasonable land-taxes, suppressing duties and demanding free trade;
- the foundation of agronomical schools at scientific, technical and vocational level;
- the stipulation of conventions with both the private and public sector in order to promote activities geared to the instruction of specialized personnel in the agrarian field, with particular reference to developing nations;
- the promotion of research and studies in order to provide new incentive to hilly land agriculture and to improve Italian forest resources.

In more recent years, the Academy has updated its research instruments to meet current requirements: in fact, since 1984, it has been an acknowledged institute which specializes in applying the most recent technologies to agriculture, such as agricultural production forecast, cultivation optimization,

preparation of environmental cartography and realization of data banks and agroclimatology.

Therefore, the Academy, in addition to being an institution that keeps historical archives, it is also a promotional centre of enterprises and research in order to face and solve the problems in the agricultural field.

4. THE PROJECT REALIZATION

In order to prepare a technical documentation of the damages caused by the explosion in Via Georgofili, a tridimensional numerical photogrammetric survey of the area was made. The boundaries on four sides were Via Castellani, the Arno river, Via Por Santa Maria and Piazza Signoria.

The project included two distinct surveys: one made use of terrestrial photographs taken at the base of the Pulci tower; the other included aerial photographs over the area of attack.

For the terrestrial survey, two pairs of overlapping photographs of the southern wall of the Pulci tower were taken. Spatial local coordinates of eight points on the same wall were determined by a conventional theodolite in order to control the geometry of the representation.

I.G.M.I.'s surveyors took the terrestrial photographs with a single camera, the optical axis of which was inclined with respect to the horizon. It was mounted on a tripod and placed in sequence at the end points of a line, almost parallel with respect to the wall, 14 metres long and at a distance of 26 metres from the tower, taking advantage of the operational conditions as best as possible.

The numerical compilation of this southern wall (oriented toward the Arno river) was performed by means of an analytical stereoplotter equipped with special graphic software. The aerophotogrammetric flight was carried out by the "Compagnia Generale Ripresearee" of Parma with a single strip of four photographs, with 60% overlap, taken by a wideangle camera and a flying altitude of 1500 metres a.s.l.

The photogrammetric control points of the strip were made by supplementing a topographic network already arranged for a previous I.G.M.I. cartographic survey.

The three-dimensional compilation of the aerial photos was performed by means of a mechanical projection stereoplotter equipped with encoders and powerful graphic software applied to a color workstation.

The equipment's capabilities allowed for the integration of the terrestrial and aerial surveys in a unique three-dimensional model, representing the characteristic surfaces of the built-up area.

In this manner the most important structural elements of the partially destroyed or damaged buildings were graphically represented, together with the surrounding ones.

Several three-dimensional views were obtained. The simulated models correspond to assonometric and prospective representations of fixed conditions of observation, illumination, time and position of the surveyed area.

The images were successively submitted to an editing operation in order to improve the videographic definition without losing their characteristic digital appearance.

This was, in fact, made possible by means of retouching software applied to a workstation of sixteen million colors.

Final elaboration was made on another station dedicated to emulating the print of real colors; two types of corrections were carried out on each image: one was to modify the color's intensity, while the other was to mask preferential areas in order to obtain the desired chromatic effects.

The last phase of the project concerned the preparation of four-colour process films through a high precision laser-plotter.

5. THE IMAGES

On the whole, fourteen digital images were prepared whose characteristics are described below:

Image 1 - General plan

Simulation lighting : solar light 0.7, ambient light 0.3

Time : May, 27 1993; hour 6 p.m.

Geographical position : latitude N41°, longitude E15°

Scale: 1/2000

Image 2 - General perspective

Exposure station's simulated conditions: camera focal length 50mm., elevation 500m.

Simulation lighting : solar light 0.7, ambient light 0.3

Time : May, 27 1993; hour 6 p.m.

Geographical position : lat. N41°, long. E15°

Image 3 - Perspective view of the area directly hit by the explosion

Exposure station's simulated conditions : camera focal length 50mm. elevation 150m.

Simulation lighting : solar light 0.7, ambient light 0.3

Time : May, 27 1993; hour 6 p.m.

Geographical position : lat. N41°, long. E15°

Image 4 - NorthWestern assonometric view of the Pulci tower

Simulation lighting : solar light 1.00, ambient light 0.3

Time : May, 27 1993; hour 6 p.m.

Geographical position : lat. N41°, long. E15°

Image 5 - Perspective view of the top stories of the tower and surrounding buildings

Exposure station's simulated conditions : camera focal length 28mm., elevation 10m.

Simulation lighting : solar light 0.7, ambient light 0.3

Time : May, 27 1993; hour 10 a.m.

Geographical position : lat. N41°, long. E15°

Image 6 - NorthWestern assonometric view of the tower and facing buildings

Simulation lighting : solar light 1.00, ambient light 0.3

Time : May, 27 1993; hour 10 a.m.

Geographical position : lat. N41°, long. E15°

Image 7 - Northern assonometric view of the tower and facing buildings

Simulation lighting : solar light 1.00, ambient light 0.3

Time : May, 27 1993; hour 10 a.m.

Geographical position : lat. N41°, long. E15°

Image 8 - Southern assonometric view of the tower and surrounding buildings

Simulation lighting : solar light 1.00, ambient light 0.3

Time : May, 27 1993; hour 10 a.m.

Geographical position : lat. N41°, long. E15°

Image 9 - SouthWestern assonometric view of the Pulci tower

Simulation lighting : solar light 1.00, ambient light 0.3

Time : May, 27 1993; hour 10 a.m.

Geographical position : lat. N41°, long. E15°

Image 10 - SouthWestern perspective view of explosion's effects

Exposure station's simulated conditions : camera focal length 85mm., elevation 140m.

Simulation lighting : solar light 0.7, ambient light 0.3

Time : May, 27 1993; hour 12 a.m.

Geographical position : lat. N41°, long. E15°

Image 11 - Western assonometric view of the Pulci tower

Simulation lighting : solar light 1.00, ambient light 0.3

Time : May, 27 1993, hour 6 p.m.

Geographical position : lat. N41°, long. E15°

Image 12 - Western perspective view of the Pulci tower

Exposure station's simulated conditions : camera focal length 35mm., elevation 70m.

Simulation lighting : solar light 0.7, ambient light 0.3

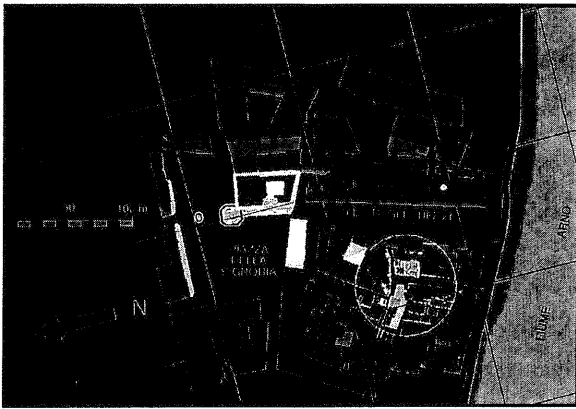


Image 1

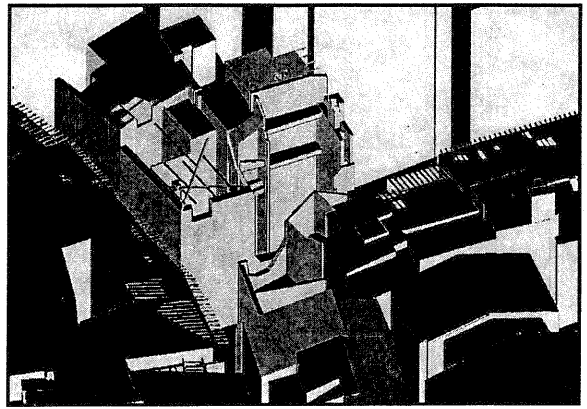


Image 4

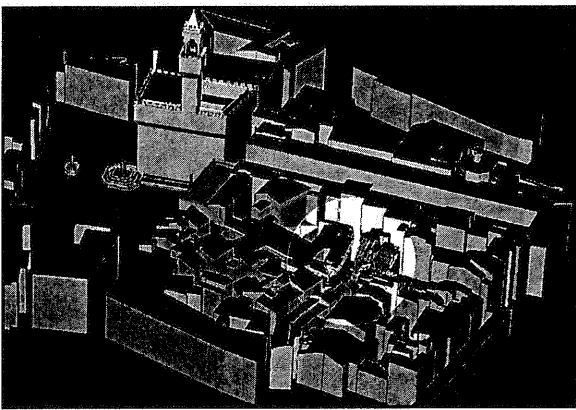


Image 2

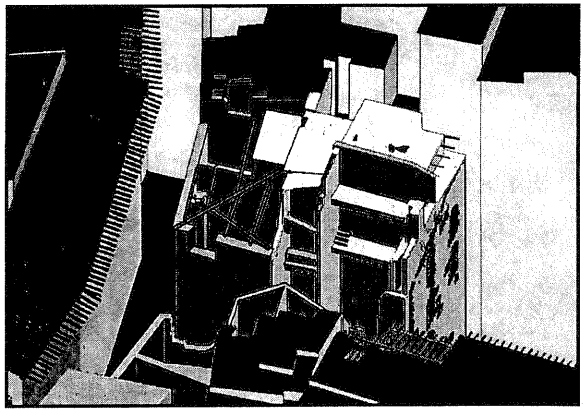


Image 5



Image 3

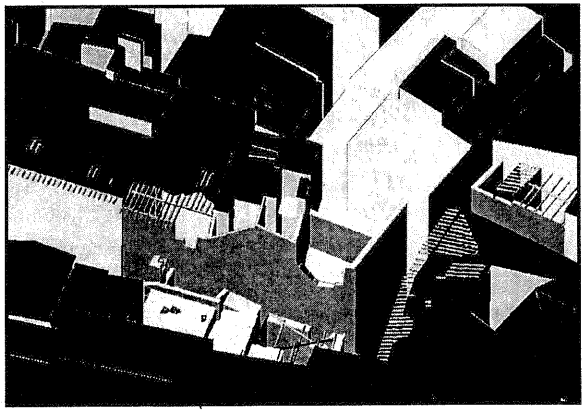


Image 6

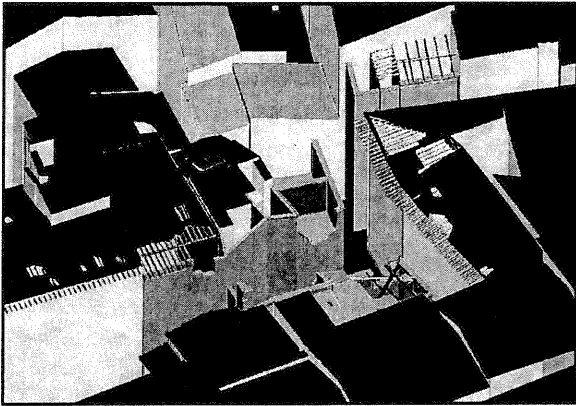


Image 7

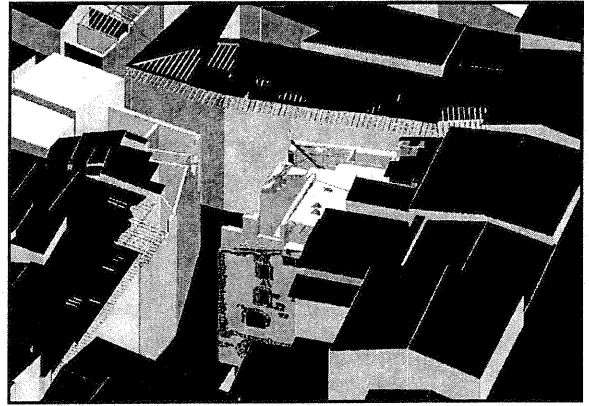


Image 9

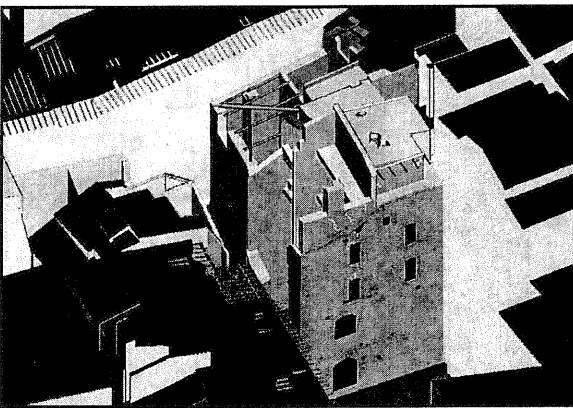


Image 8

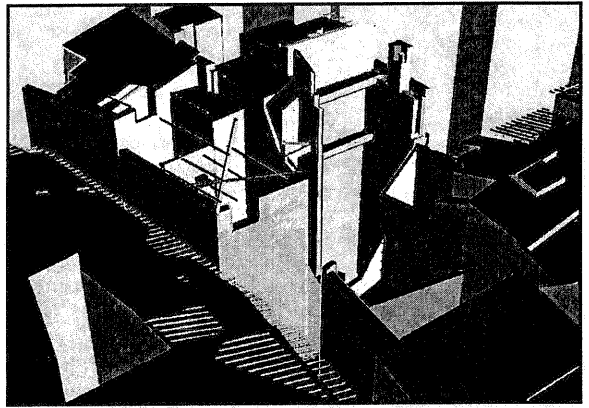


Image 10

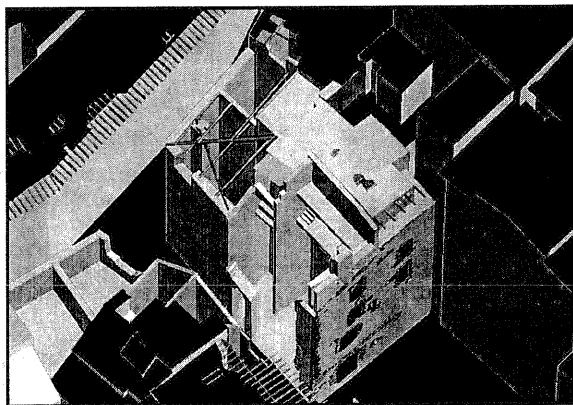


Image 11

Time: May, 27 1993; hour 6 p. m.

Geographical position: lat. N41°, long. E15°

Image 13 - Terrestrial photogrammetric survey of the tower's southern front

Camera focal length: 64,28 mm.

Exposure station's inclination axis: 7° and 15°

Time: July, 10 1993; hour 10 a. m.

Scale: 1/150

Image 14 - Southern perspective view of the Pulci Tower and Old Palace

Exposure station's simulated conditions: camera focal length 35 mm., elevation 65 m.

Simulation lighting: solar light 0.7, ambient light 0.3

Time: May, 27 1993; hour 6 p. m.

Geographical position: lat. N41°, long. E15°

6. FINAL CONSIDERATIONS

The work described in the previous pages involved several professional I.G.M.I.'s figures, such as photogrammetric photographers, surveyors, stereoplotter and workstation operators; such personnel were engaged to their utmost in order to face and solve the encountered technical problems.

The demonstrated care and passion and the achieved result represent, on the part of all the personnel at I.G.M.I., a civil response to the attack that mutilated a patrimony of Italian learning.

7. ACKNOWLEDGMENTS

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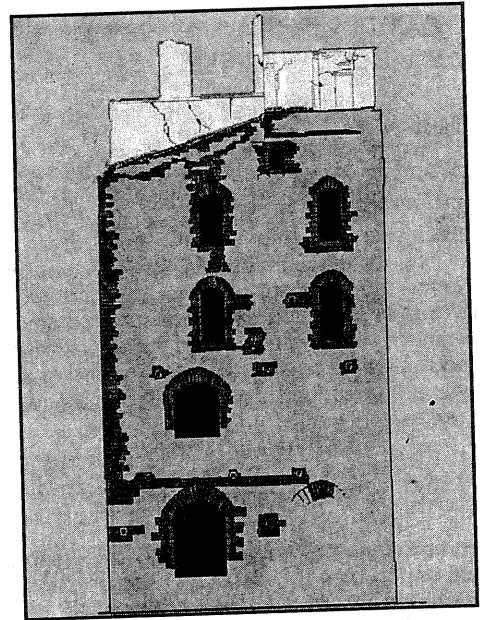


Image 13

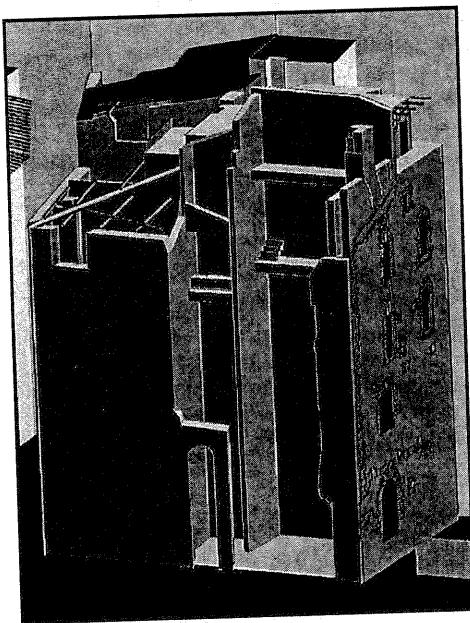


Image 12

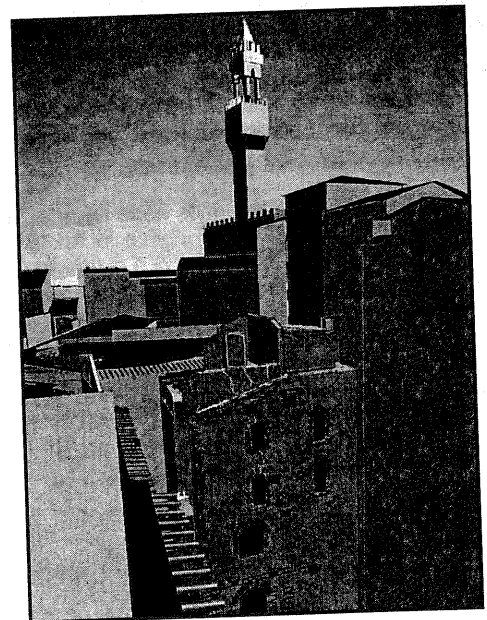


Image 14