

METHODOLOGY OF ACQUISITION OF MULTIPLE DATA FOR MONUMENTS AND HISTORIC CENTERS

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ABSTRACT

This paper concerns combined photointerpretation and photogrammetric study of extended historical centers and particularly of Olympia historic center.

At first the possibilities of photointerpretation study are presented and the possibilities of analogic methods with graphical and digital products follow.

Simultaneous taking of suitable digital data can offer possibilities of automatic orthophotography production.

The kind of study that is proposed facilitates (time-cost) the formation of integrated archives of monuments and historic centers as well of relative Geoinformation Systems.

It can be applied independently the extent of the historic center as well as in internal areas.

1. INTRODUCTION

In this paper, the procedure of acquisition of multiple information from airphotographs of areas with monuments and historic centers are presented.

This procedure includes Photointerpretation and Photogrammetric methods.

Especially the photogrammetric methods concern the acquisition of graphical documents and digital data for the various parts of monuments and historic centers, but also for the production of digitally controlled orthophotography.

Photointerpretation, graphical documents, digital data for the parts of monuments and historic centers and the possible digitally controlled orthophotograph consist particularly important and useful data for the formation of Photogrammetric archives of monuments and historic centers and for the organisation of relevant G.I.S.

2. PROCEDURE

For a first initiation on the physical aspect of the area, we deem useful an initial photointerpretative study, based on aerial photography of 1:20,000 scale, by mirror stereoscope (WILD ST4) equipped with magifying binoculars x8.

Figure 1 shows the results of this process. Information about monuments obtained in this phase, is rather generalized; yet, a careful use of photointerpretative rules makes possible their location.

There followed a process in scale 1:5,000, based on the same aerial photographs (scale 1:20,000) with WILD A7 Autograph, combined with a WILD EK8 recorder. This work, Fig. 2, included:

Acquisition of digital data (model coordinates x, , z at the junction points of a grid for the whole model, some of which are shown as crosses (+) at Fig. 2) from which preparation of digitally controlled orthophotograph would be at first possible.

Graphical restitution of monuments.

Acquisition of digital data (model coordinates x,y, z) concerning monuments (points 113-141).

A corresponding process was carried out through the same instruments (WILD A7, EK8) based on aerial photography 1:4,000 scale, in map scale 1:1,000 Fig. 3.

Digital data were obtained for the preparation of digitally controlled orthophotography.

A graphic document was drawn indicatively for one monument and

Digital data (points 205-249) were taken for the architectural parts.

3. CONCLUSIONS - DISCUSSION

The graphic, analytical, photographic (rectification, orthophoto) photogrammetric procedures, present advantages of varying degrees for each problem.

The acquisition of a multiple document, in spite of relative difficulties, should prove of great value for many instances.

This is of particular interest for historical centers with their wide area, for development programs, as well as for the formation of complete photogrammetric archives.

Existing procedures and instruments for digitally controlled orthophoto, for which preparation digital terrain data of the area are required, which may be effected through an analogue instrument, lead us to consider a simultaneous taking of digital data concerning the architectural parts of the monument or even to a simultaneous graphical restitution.

This procedure has been applied concerning the archeological site of ancient Olympia, a great historical center of extensive interest.

The density of terrain points and of architectural details was taken indicatively in order to illu-

strate this procedure and can be adapted to individual needs and requirements.

Also the details of graphical restitution can be prescribed according to individual requirements.

It is advisable to use different scales for different purposes: small ones for overall aspects and large ones for detail.

The kind of monument and the requirements for details in the document, should be the ruling factors.

The fact that, working on a model on an analogue instrument we obtain graphic data, digital data for details concerning architectural parts of the monument, or even digital data for further automatic preparation of orthophoto, is of particular importance, especially useful for the formation of photogrammetric archives of monuments and historic centers and the organisation of relevant Geoinformation Systems.

We also consider the application of this procedure on terrestrial Photogrammetry as feasible.

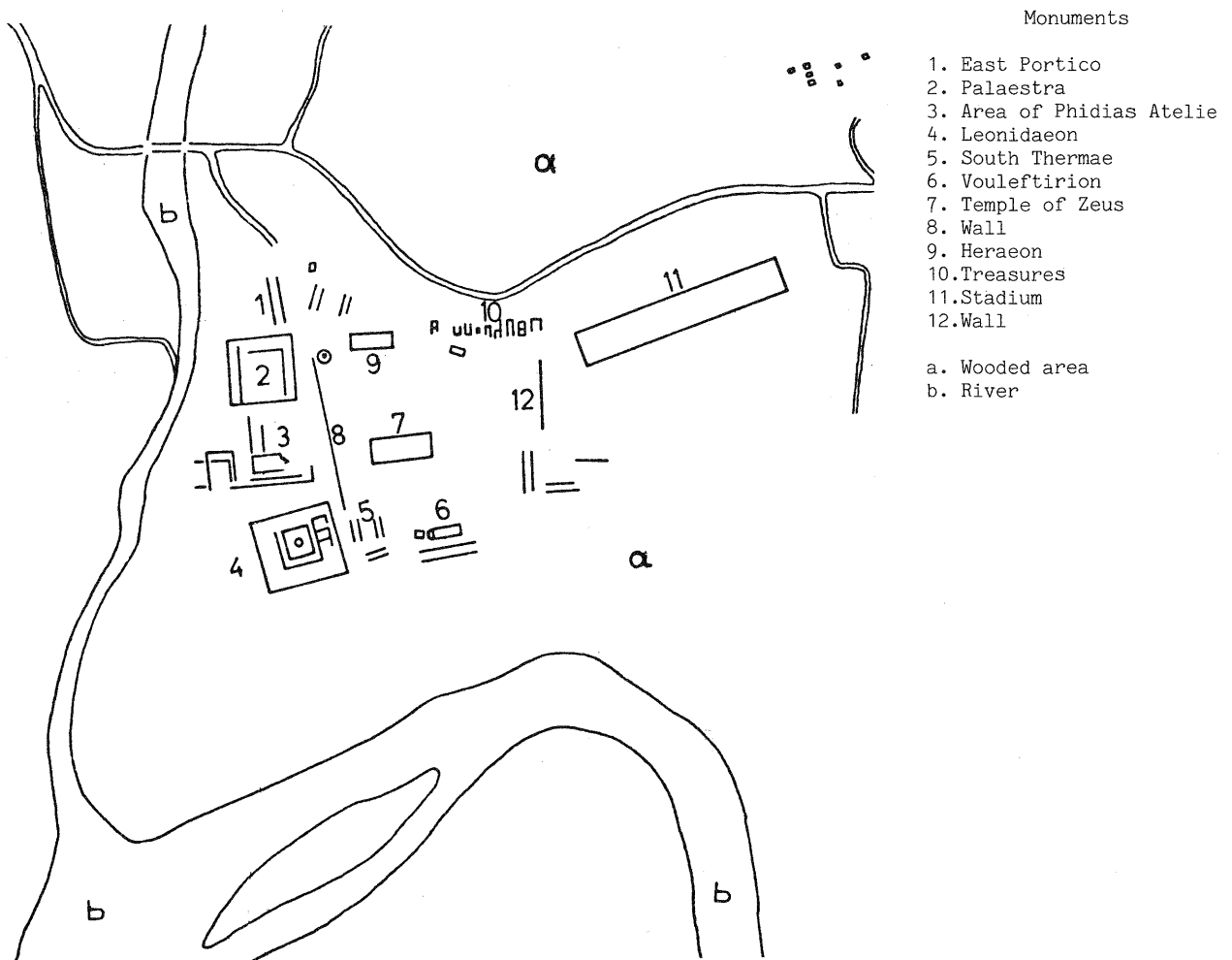


Fig. 1: Photointerpretation of the area of Olympia historic center from airphotographs in scale 1:20,000.

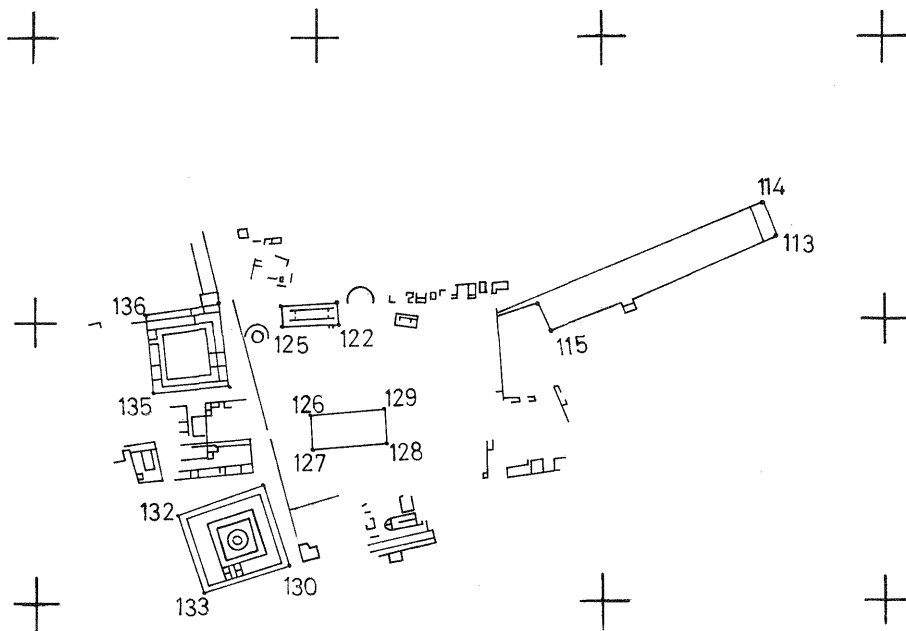


Fig. 2: Restitution in scale 1:5,000 from airphotographs in 1:20,000 (reduced). The monuments and points of them (113-141) for which digital data were taken and some of the locations (+) that digital data were taken indicatively for further preparation of digitally controlled orthophoto, are presented.

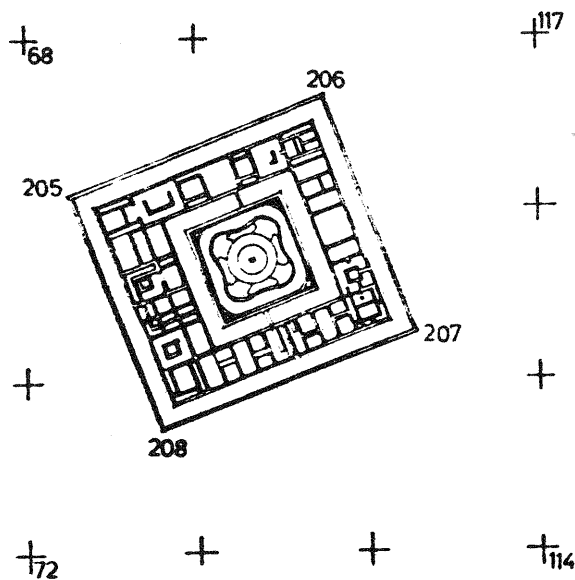


Fig. 3: Restitution in scale 1:1,000 from airphotographs in scale 1:4,000 (reduced). Monument number 4 of Fig. 1 (Leonidaeon), some of its points (205-249) for which digital data were taken, and some of the locations where digital data were taken indicatively to further preparation of digitally controlled orthophoto are illustrated.

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