

P-AR11 GEOPHYSICAL SURVEYING AND PHOTOGRAMMETRY AT THE ACROPOLIS OF BOUTHROTOS, S. ALBANIA

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During the 1995 summer archaeological campaign, selected areas of the archaeological site of the Acropolis of Bouthrotos, located in southern Albania, were explored by geophysical prospecting techniques. The campaign took advantage of the research undertaken since 1991 by the Hellenic archaeological mission (headed by Dr. C. Hadzi) through the bilateral albanian-hellenic protocol for the S&T cooperation. The site consists of a number of Classical, Hellenistic and Roman monuments. It had flourished in the period between the 7th-5th centuries B.C., while it retained close contacts with the island of Kerkyra and a number of sites of Chaonia and became centre of the confederation (Koinon) of the Prasaiboi during the Hellenistic period. Most of the monuments in the area are badly preserved and are covered by thick vegetation.

The geophysical survey was conducted at the top of the Acropolis, in search of the earlier settlement (Archaic period). The goal of the geophysical project was to map the shallow depth layers of particular regions of the site in an effort to locate remnants of archaeological structures and explore the possible success of a future systematic geophysical survey. Similar work was conducted in 1993 on the acropolis by an Albanian team headed by Dr. Avxhiu.

Photogrammetric measurements were performed, in an effort to link the location of the major surface monuments with topographic data. The project had planned the production of a reliable small-scale topographic map of the surface monuments (which was not completed) and the subsurface relics revealed by the geophysical surveys. Comparison with data from other sites of Epirus are expected to provide valuable information regarding the habitation patterns of the area.

A total of about 1600m² was covered by a combination of magnetic and resistivity techniques. The areas of study were selected on the basis of the surface monuments of the site, under the guidance of the Head of the Hellenic mission (Dr. C. Chatzi). A small number of areas in the vicinity of the surface structural remains and the excavation trenches was systematically investigated. This facilitated the final registration of the anomalies detected into the general topographic map of the site. Soil resistance measurements were performed using the Twin probe configuration. Resistivity soundings were employed in specific areas for enhancing our knowledge of the stratigraphy and the vertical extension of certain features. The difference mode was used in carrying out the total magnetic field intensity measurements. The data were analysed in both the spatial and frequency domains. FFT techniques were able to recognise the noise level of the data and the regional geological trends, both of which were removed by appropriate filtering of the data. Band-pass filters were successfully applied, along with other processing techniques in order to isolate the signals created by the archaeological relics. Dot density, contour and grey scale maps were successful in indicating the habitation patterns of the site. Nevertheless, there was an absence of extended linear geophysical anomalies and features were hardly recognised. Vegetation complicated further the task of interpretation of the geophysical maps.

As a general conclusion, the high resistivity values, as well as the measurements of the total magnetic field intensity and the electrical soundings indicated that the underlying monuments are badly preserved, evident in the lack of geometrically shaped geophysical anomalies. The poor preservation of the archaeological relics at Bouthrotos has suggested the urgent need of taking action, a challenge that has to be met in the future through the more systematic application of geophysical prospection techniques. It is hoped that a closer collaboration between the Albanian and the Greek teams could expand the geophysical investigations in the wider region of the Acropolis, and contribute to the preservation of the archaeological site of Bouthrotos.

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O-AR6 SOME RESULTS OF GEOPHYSICAL PROSPECTING IN ARCHAEOLOGICAL SITES OF BUTRINTI AND APOLLONIA

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The ancient cities of Apollonia and Butrinti are two of the biggest archaeological settlements of Albania. Different cultures corresponding to distinguishable stages of social development had been proved. Despite of the great work carried out by archaeologists, only a small part of these sites has been discovered.

In this framework, exploration for archaeological buried structures using geophysical methods has been and is necessary. It has recently recognised a remarkable progress.

In this paper are presented some of the most interesting geophysical results. Field procedures, data processing and their interpretation accompanied by archaeological data are also discussed.

We have also to point that the geophysical prospecting was carried out in two sites, which differ from the geological point of view (level of bed rocks, sort of building materials, etc.). That is why we have tried to highlight the differences raised during the application of the geophysical methods.

Magnetic and resistivity methods have been used.

Measurements of the total magnetic field were carried out by means of MP-2 proton magnetometers. In order to increase the efficiency of the surveys a less dense measurement grid, but having no influence on the obtained results, was used.

High effectivity of this method, clearly shown in the different archaeological sites, has led to the detection of archaeological targets such as wall remains, ditches, kilns and metal objects. Efforts to estimate the outlines of the geophysical anomalies and archaeological targets related with them have also been made.

Traditional Wenner array and others were used to measure apparent resistivity by DC techniques. These measurements were accompanied

by short-array resistivity soundings. On the integrated geophysical methods, the resistivity data have led to a better and more detailed explanation of the archaeological features.

Data processing is performed by SURFER and TGP programs one is Their presentation is made in contour plots, grey-scale images, dot density plots and 3-D graphic representation.

An interesting solution was given by the resistivity soundings applied for the “geomorphological study” of an area, in the vicinity of Butrinti, considered as prospective for archaeological excavations. Electrical soundings were carried out along two lines: A-A (350 m) and B-B (500m). The distance between soundings was 50m and the investigation depth up to 40 m.

INTSASE and PPSELV program packages and INTCIL program package were respectively used for the interpretation of soundings and the study of resistivity variations in geoelectrical pseudo-cross-sections.

As a conclusion we would say that the excavations carried out in particular sectors of these archaeological sites have clearly shown the great contribution of geophysical prospecting methods. Consequently, one have to include them in archaeological programmes of all stages, from first reconnaissance through to excavation activity of every area.