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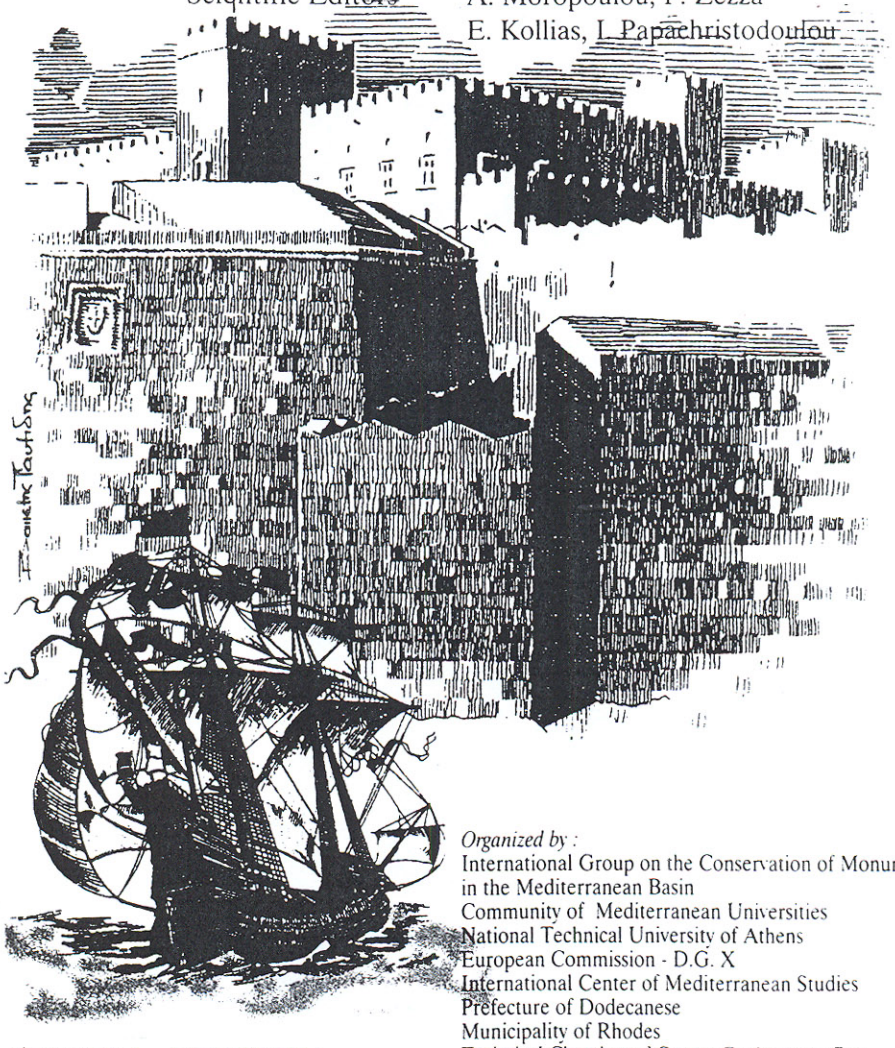

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NATURAL - GEOLOGICAL PROCESSES AS A DESTRUCTION FACTOR OF THE FORTIFICATIONS AND DECAY OF THE ANCIENT "KATO POLI" OF EDESSA (MACEDONIA, GREECE)

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ABSTRACT: The geographical position of town of Edessa (Western Macedonia, Greece) made it the centre of political, social and financial activities at the times of Filippos II and until the Roman era. After extensive research in the downtown area, the data collected confirmed that the natural-geological processes played a major part in the eventual decline of the town. The features found are: (i) deposits of travertine limestones that formed a veil atop the defensive walls, (ii) botryoidal deposits inside the walls over ruins Roman era, (iii) typical erosional features on the fortifications caused by overflowing water, (iv) alternations of deposits and reconstruction material. These features indicate that apart from any political, financial, social and military cause that contributed to the decadence of the town, natural-geological processes made life in Edessa difficult and accelerated the destruction of the fortification walls, in spite of the efforts of maintaining the status of the town as it had been established in the first.

Introduction

The city of Edessa has constituted for a long period of time a pole of attraction for political, religious and commercial activities owing mainly to its geographical position in Western Macedonia, Greece. The ancient city was separated in the Uptown and Downtown due to the existing morphology of the area. It was developed mainly during the first BC and AC centuries and it was characterised by the presence of fortification works as well as of a natural defense, which were protecting the activities of the inhabitants. Since the 4th century AC the "Kato Polis" begun to decline and, aside from the human factor, a predominant role in this process is attributed to the natural-geological phenomena which were gradually toughening the life of the citizens within the walls and destroyed a large part of the fortification structure. The natural-geological processes that left indelible signs on the ancient wall are described hereafter, subsequent to some basic morphological, historical and geological information on the city of Edessa.

Morphological conditions

The broader area of the city of Edessa is characterised by an intensely variable relief with a significant complexity due to the composite geological structure and evolution. In particular, the broader area of Edessa is characterised by the presence of successive level surfaces which generally dip to the east, where they are discontinued by steep slopes of transverse direction and of a height of about 50-150 meters.

In the city of Edessa, from a morphological point of view, two level surfaces can be distinguished. The upper level has an elevation of 300-320 meters and is located towards the west. The ancient Ano Polis ('Uptown') as well as the current city of Edessa were built on this surface. The lower level is located eastwards at an altitude of 150-180 meters where the ancient city with the ancient fortification wall was built (Fig. 1, 2).

In between the two level surfaces there is a morphological discontinuity on which the famous water falls are formed from the surface runoff. Finally, mountainous areas of significantly higher elevation occur towards the north and the south.

Historical information on the city of Edessa

The city of Edessa which was built at a 'key' location between the mountainous and the flat areas of Macedonia and was renowned for its natural beauty depicted by the ancient authors and travellers, was one of the most important cities of ancient Macedonia.

The presence of mankind in the broader area is traced back to the Neolithic age, while for the city of Edessa the oldest to date findings go back to the age of Copper. Unfortunately, the findings are quite restricted for the following periods up to the 4th century BC, a fact which indicates that Edessa was a small village (Kakavogiannis[1]).

The urbanisation and the transformation of the small rural village to an organised fortified city possibly started since the mid 4th century BC during the reign of King Philippe II.

The city was divided in two levels: The Ano Polis which was fortified and reformed to a settled community with the military and religious centre. The major defence protection of the Ano Polis, was provided by the waters of the river which were encircling the city and were flowing along the walls. In this

Figure 1. Part of the fortification wall of the "Kato Polis" and a view of the present city of Edessa at the upper level.

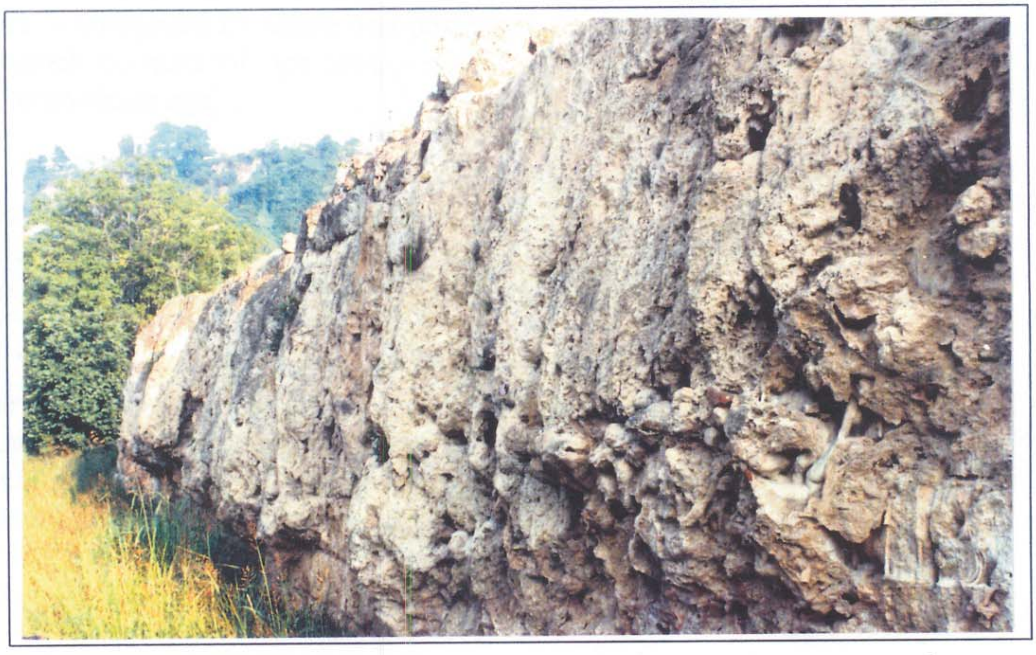

Figure 2. Characteristic deposits of travertine limestone in the form of a 'veil', created by the waters which covered part of the fortification wall of the "Kato Polis".

section of the city no important buildings have been found, while according to certain scripts some churches and administrative buildings should exist.

The “Kato Polis” was developed at the lower level, at an area of about 200 acres and was bound by an historical wall approximately 1500 meters long. The wall was about 5 meters high and 3 meters wide. It was constructed at the end of the 4th BC century and subsequently many succeeding restorations took place. Today there are three excavated gates along the wall. Major roads were starting from these gates and constituted the main city planning axes, while the first visible buildings belong to the Roman period.

Following the surrender of Macedonia to the Romans and the establishment of ‘Pax Romana’ the city started to decline. In the ages of emperor Ioustinianos an attempt was made to maintain the walls. Finally, after the 6th century B.C. both the city and its walls were abandoned, while the human activities were being constantly limited up till the recent times when the city regained the liveliness of a contemporary urban centre, with the water falls being its main attraction (Giannakis[2]).

Geological conditions

According to the bibliographic data (Mercier & Vergely[3], Stoidis[4], Mariolakos & Lekkas[5]) and the detailed geological investigations that were carried out, the area is composed by alpine and postalpine formations. Specifically, the alpine bedrock consists of ophiolithic rocks of Jurassic age and flysch of Upper Maestrichtian age.

The postalpine formations which include travertine limestone of Pleistocene-Holocene age, talus screes of Pleistocene-Holocene age and river alluvium and torrential deposits of Holocene age, are lying unconformably on the alpine formations.

The city at its upper morphological level surface was mainly developed on the river alluvium and torrential deposits of Holocene age as well as on some outcrops of the alpine formations. On the other hand, the “Kato Polis” and the wall are founded on travertine limestone of Holocene age as well as on torrential deposits of the same age.

Observations on the action of natural - geological processes

As it was mentioned above, the old city which was built on the lower morphological plane included some important fortification works as well as some significant buildings. Given that the buildings within the walls could not be investigated due to the lack of extensive excavation works and to their concealment by transported fill material, the observations were focused mainly

on the historical wall which in its greatest part was revealed by the excavations.

Along the wall and at various locations, we observed:

- Deposits that were covering the wall in the form of a 'veil' at intervals of 10-40 meters and of a thickness of about 0.5 meter (Fig. 2). These deposits consisted of travertine limestone and had essentially 'fossilised' the movement of water which had deposited them. This indicates that the running waters flooded the city, exceeding the height of the wall (up to 5m), and as a consequence ruined any activity in the city.
- Botryoidal deposits of travertine limestone over the ruins of the Roman period (Fig. 3) in the internal part of the walls as well as atop the wall, with a thickness that reaches about 2 meters, revealing again that the water which was the main agent of deposition reached a level much higher than that of the city and the wall.
- Various peculiar erosional features both of the wall itself and of the deposits that are covering it. In particular, the 'V'-shaped type was characteristic, which indicates prolonged flow and weathering effect over the wall and its coatings (Fig. 4).
- Successive deposits of travertine limestone and reconstruction material - flagstones of Roman-Byzantine period of the wall, which indicate sequential flood phenomena which deposited the geological formations and attempts of restoration of the wall by the inhabitants of the city.

Synthesis of data - Conclusions

The activity of certain natural-geological phenomena is many times decisive for the historical evolution and course, while the accurate knowledge of the occurrence, the progress and the consequences of these phenomena is absolutely necessary for the interpretation of historical questions. The human activity and the historical events have taken place in an environment on which the natural-geological processes predominated and changed the preexisting conditions either instantaneously (e.g. earthquakes) or progressively. Hence the coevaluation of these phenomena with the historical data yields a different dimension in the interpretation of the events through the prism of a thorough scientific validation.

In the city of Edessa in particular, the natural-geological processes played an important role in the entire process that led to its decadence since the 4th century BC. Specifically, aside from any changes in the activities of the citizens which were due to political, social, military or religious roles an important role is attributed to the natural-geological processes. The initially deficient maintenance and inspection of the river water courses and the

Figure 3. Travertine limestone of botryoidal shape within the wall of the "Kato Polis", which overlies ruins of the Roman period.

Figure 4. Travertine limestone with extraordinary erosional features of 'V' type on the flagstones of the fortification wall of the "Kato Polis".

blocking of the rain water pipes resulted in the generation of flooding phenomena in the area inside the walls as well, namely in the “Kato Polis”.

The flooding phenomena and the prevalent pattern of water flow are accountable for the deposition of travertine formations of various shapes and possibly of other transported materials resulting in the intensification of the floods and the uncontrolled flow. Any attempts to repair the services as well as the walls during the Roman-Byzantine period did not progress to a great extent and as a consequence the deposits of geological formations were gradually covering the city and the wall. These deposits, in the form of a thick enough ‘veil’ over some sections of the wall, along with the ‘V’ shaped deposits are indicative of the abandon of the city and also of the unconditional surrender and admittance of the natural-geological phenomena by the last inhabitants.

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