

WHY ARE THE FOUNDATIONS OF THE EGYPTIAN TEMPLE OF KARNAK CRUMBLING INTO SAND? AN INTEGRATED ARCHAEOLOGICAL, GEOPHYSICAL AND ENGINEERING STUDY

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Abstract

Built over a period of more than two millennia, from ca. 2000 BCE-300 CE, the Karnak Temple in Egypt is arguably the largest preserved place for worship from the ancient world. The temple's foundations made of weak porous sandstone, exhibit significant deterioration recently. Rise in groundwater level and salinity are main factors causing and accelerating the stone deterioration (Sarazin, et al., 1986; Attia, 2001). Nevertheless, causes of these problems are not well-understood. The impact of the foundation deterioration on the historical value and the stability of the temple's constructions are not well-evaluated. To evaluate these problems, we introduce integrated archaeological, geophysical and engineering investigations. The geophysical investigation will evaluate the groundwater problems using resistivity, seismic, and chemical analysis of groundwater. The engineering study will evaluate current and future impact of foundation deterioration on the safety and stability of the temple's structures. The archaeological study will focus on the impact of the stone degradation on the inscriptions carved on the temple's architectural surfaces: walls, columns and roof structure. This multidisciplinary study will assess the causes of the stone deterioration and its impact on the temple, and provide a working model that can be applied to preserve other historical sites with similar problem around the world.

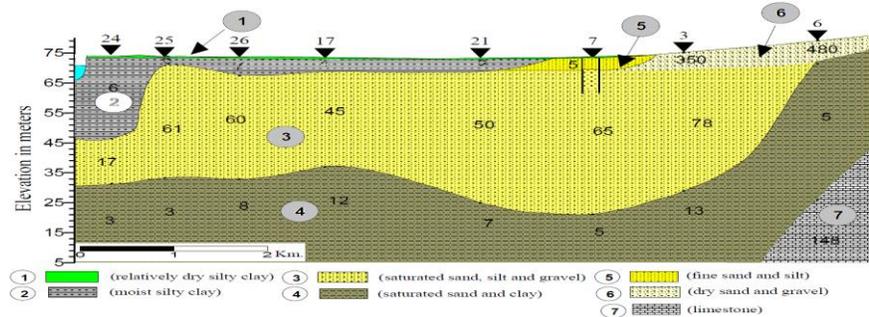


Figure 1: Deteriorated foundation (left) and resistivity profile (right), Karnak Temple in Egypt.

References

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