



## **Depositional environments and chronostratigraphy of Holocene sediments in Ancient Karnak (Egypt)**

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This paper aims to detail the results of an original geoarchaeological study, led in Upper Egypt, in the western part of the Karnak Temples complex. The geoarchaeological approach applied here helps to better understand the Nile River dynamics in the close vicinity of the pharaonic site. Our investigation focused on the jetty discovered by the archaeologists of the Supreme Council of Antiquities in front of Karnak Temple (under the local supervision of Dr. Mansour Boraik).

The methods comprise the study of several stratigraphic profiles and of eight manual auger boreholes (up to a maximum depth of 5.50m) and percussion drillings (to a maximum depth of 25m below the surface, circa 70 m above mean sea level). Sedimentological analyses which include grain-size distribution (sieving method employed, from 20 to 2000  $\mu$ m in mesh size) and a magnetic susceptibility study of the different sediments help to identify the Nile River deposits and to reveal the ferromagnetic content of the sediments (200 samples were analysed). In doing so, it was possible to characterise the Nile River deposits and to identify the presence of aeolian deposits (associated to wadi fans) in the lower part of the boreholes in both the Karnak and Coptos sites. The data also clearly indicate the later continuous occupation of Nile River in the neighbourhood of the sites. Fluvial dynamics characterized by flood events, sandy accretions and large Nile silts/clay deposits are presented and discussed here for later palaeoenvironmental reconstruction.

The accurate levelling of the different profiles and boreholes, with the help of a topographic survey, allow us to recover long sedimentological sequences and to correlate the different sedimentary units. Finally, in order to obtain a chronostratigraphic sequence, radiocarbon dates were obtained from charcoal/ash samples (analyses undertaken at the laboratory of radiocarbon dating of Ifao, Cairo, Egypt). Two important Nile flood events are recorded (ca 1450 BC and 200/300 AD) and possible links with the drainage basins changes in terms of landuse and of sediment budget increase are discussed.