

**AN IMPORTANCE OF NEOLITHIC-EARLY DYNASTIC-THE END OF OLD  
KINGDOM TRANSITION IN ANCIENT EGYPT. GEOLOGICAL EVIDENCES OF  
CLIMATIC OSCILLATIONS – FUTURE PROJECT.**

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*Field as well as archaeological, mineralogical and geochemical investigation of Nile Delta settlement and sediments will be performed, during the future project presented in this paper. Presented project will explain the impact of climatic changes on Neolithic-Early Dynastic-the end of Old Kingdom transition in the history of ancient Egypt.*

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### **Introduction**

The main aim of presented project is to chart the changes, which took place in Nile's Delta's settlement between Predynastic and Roman Period. Chronology of analysed phenomenon holds in almost four thousand years of ancient Egypt's history – between ca. 4 000 BC (beginning of the most significant climatic changes in that region) to the beginning of our era, when Romans took control over Egypt. In the light of contemporary archaeological research results it appears, that most of the archaeological sites placed in Nile Delta, representing Predynastic to the end of Old Kingdom settlement, were unexpectedly abandoned. Some of them were settled again in later periods, especially in the Roman Period

– after ca. 3 000 years. A typical example of such situation is well-known, overhauled in the 2. half of XX century site Minshat Abu Omar, located ca. 150 km to the north-east from modern Cairo. It was abandoned in Early-Dynastic Period and resettled again in Greek-Roman Period (Kröper, 1999). Such situation was on Minshat Ezzat and Kom el-Khilgan sites. Although return of the people on the prior settlement wasn't a general rule. We have such situation at e.g. Tell el-Farkha or Tell el-Murra sites. Research conducted at those sites by Jagiellonian University archaeological expeditions show, that intensively utilized in Early-Historic Period they disappear from the Nile Delta settlement map until modern times (Chłodnicki, 2012). Very interesting is also the issue, that some places important for Egyptian state function – capitals and administrative centres – e.g. Mendes (Tell el-Ruba), worked through the whole antiquity (Wenke, 1999). One should formulate a basic question: why there and other similar places the settlement pulled through whole antiquity, and other sites were abandoned for ever or were resettled again after a huge break? Proposed project should answer all these questions and solve all presented problems.

Up till now archaeology wasn't able to answer those questions about reasons of that phenomenon. There are no scientific publications, which will attempt to explain these issues in more complex and more descriptive way (Pawlikowski 2013).. But intensification of excavation in the Nile Delta in the last few years almost force necessity to undertake interdisciplinary research, which will bring presented problem to the light. It will allow us to fully and precisely understand a diversity of the causes, that had a significant influence on creating cultural picture of the ancient Nile Delta. Such research will comprise a great contribution to the knowledge about ancient society migration and the earliest history of formatting Egyptian State.

### **Theory of climatic changes**

The most likely explanation seems to be an instance of far-reaching climate change that has occurred in the Nile Delta, about 4 000 - 2 200 years BC. They would effectively prevent further habitation of the area. The geological studies irrefutably demonstrated that in the period around 3 000 BC to the beginning of our era, major changes occurred in the shape of the coastline in the territory of today's Egypt. Long-term accumulation of sediments carried by the waters of the Nile has resulted in a shift further north the border between the mainland and the Mediterranean Sea. Furthermore, carried down the river alluvial material accumulated in front of the head of the Nile, and contributed to the change of the network of water - the main Nile branches in the Delta have been divided into many smaller

watercourses (Butzer, 1976; Butzer, 1995; Stanley, Warne, 1993; Hassan, 1997). All these factors dramatically affect the geographical and natural environment of the area. It seems that it could not remain without influence on the decision to leave the territory by the ancient Egyptians and to search for more suitable places for existence. Changing environmental conditions have a huge impact on every aspect of life of the local population - primarily agricultural economy, base of their income. Some researchers dealing with the issue involves the collapse of ancient Egyptian Old Kingdom, not only with the socio-political factors that have led to political instability, but also climate changes, which are a serious blow to the Egyptian economy. The present project will also clarify these issues.

Theory of key impacts of climate change on the situation in the Nile Delta settlement appears to be the most likely, though by no means we have no absolute certainty. During the implementation of the project we will focus on the analysis of other possible explanations for this unexpected hiatus in the settlement - political, social or cultural factors could also contribute to abandon ancient human settlements in the Nile Delta. In this draft we do not intend to leave these questions unanswered.

### **Project presentation**

Novelty of the present project is the fact that it will include many archaeological sites in the Nile Delta, which chronologically and culturally correspond to the undertaken problems. So far published information of the results of analyzes carried out on single archaeological sites. It prevented from drawing conclusions on such a large area which is the Nile Delta or the ancient Egypt in general.

The basis for action to implement the project will be an analysis of archaeological sites located in the Nile Delta, representing settlement and already excavated. The means to this objective will be published reports from archaeological excavation archaeological work carried out there. This will allow you to obtain data on the list of places that correspond with the issue. They are the places vacated at the end of Early-Historic and - in some cases - re-populated during the Roman Period. Obtained this way data will give the opportunity to trace the history of each of these settlements and impose them on the map of the ancient Nile Delta. This should highlight the areas mass dropped at some point in the history of ancient Egypt. Another expected result will be an indication of the state of the pharaohs zones, which have become the target of this great exodus. It will also be clearly seen on what territory the settlement returned during the reign of the Romans.

Analysis and interpretation of geographic distribution and chronology of archaeological sites in the Nile Delta will become the base for further scientific investigation of the issue. It will also allow to precise and purposeful focus of the future research, which main element will be search for scientifically valid explanations of existence of such a long hiatus in the Nile Delta settlement. For this purpose primarily archaeological and historical sources will be used. The necessary information will be extracted from chroniclers communications and ambiguous silence of material remains of human culture. Also the cooperation with representatives of the natural sciences is needed. They will be researchers from geological sciences. Their knowledge, research methodology and specialized technical capabilities are necessary to give very specific and scientifically well-reasoned answers to questions on Egyptian archeology.

An essential step in the project will be a series of research trips to Egypt. An excellent opportunity for this may become months spent on scholarship project manager at the Polish Centre of Mediterranean Archaeology of Warsaw University in Cairo. Being permanently in Egypt for an extended period of time will allow for conducting more precise research - without the pressure of a strictly limited time. Some part of stay in the country of the Pharaohs will be devoted to a query in libraries of foreign research institutes that have a rich collection of books corresponding to the theme of this project . The next stage of stay in Egypt will be a tour on selected sites in the Nile Delta, the so-called survey. This will allow for a closer look on both the current state of research as well as to current and past geography of the area. The scientific tour will be carried out in a team consisting of archaeologists and geologists. The combination of experience and knowledge of the various disciplines will be much more efficient in terms of research. Any emerging problems and questions will be constantly discussed and solved in an interdisciplinary group. Besides the personal participation of scientists from different fields will allow to perform many essential, carefully focused research and the collection of samples for specialized analysis . A similar tour will have to be repeated each year of the project - it is caused by the time constraints and other commitments of individual research participants.

During these scientific tours numerous geological drillings will be carried out. This is intended to obtain the series of representative samples of geological deposits from settlement sites for further analysis . Equally important element will be to sample and analyse archaeological materials and charcoal. The information obtained this way will result in an answer on the possible existence in ancient times significant climate change and absolute dating of studied sediments.

Other phases of the project will be devoted to a detailed analysis, precise studies and interpretation of the information and material samples collected during staying at Egypt. As much energy will be focused on the issues of the publication of preliminary research results and presenting them to a wide audience interested in issues discussed in the project at domestic and international scientific conferences.

### **Conclusions**

The presented research project is based on close cooperation between different scientific disciplines. Skillfully led research and analysis will allow to obtain specific and reliable answers to many of the concerns of contemporary scholars of ancient Egypt. Project from the beginning to the end of its implementation will be interdisciplinary in nature, in the best sense of the word. It will be based on the full, close scientific cooperation between representatives of archaeological and geological sciences, joint decision-making about the direction of research and solving doubts.

## Literature

BUTZER K. W. (1976) - Early hydraulic civilization in Egypt : a study in cultural ecology. University of Chicago Press, Chicago.

BUTZER K. W. (1995) - Environmental change in the Near East and human impact on the land. In: Sasson, J. M. (Ed.), *Civilizations of the Ancient Near East*, Vol. I , Part 2. Scribner's, New York: 123–151.

CHŁODNICKI M. (2012) – History of the reserach. In. Chłodnicki, M.; Ciałowicz, K. M. and A. Mączyńska (Eds.), *Tell el-Farkha I. Excavations 1998-2011*. Poznań-Kraków: 9-15.

HASSAN F. A. (1997) - The dynamics of a riverine civilization: A geoarchaeological perspective on the Nile Valley, Egypt. *World Archaeology*, **29**: 51 – 74.

KRÖPER K. (1999) – Minshat Abu Omar. In: Bard, K. A. (Ed.), *Encyclopedia of the Archaeology of Ancient Egypt*. Routledge, London: 636 – 640.

PAWLIKOWSKI M., (2013) - Why are there very few archaeological sites of the Eaekey Holocene in the Egyptaian Nilee Valley, Geological and geomorpjological reasons. *Studie4s in Near Eastern Production, Subsistence and Environment (16) Neolithisation of Northeastern Africa*. Springer, p. 83-96

STANLEY D. J. and WARNE A. G. (1993) - Sea level and initiation of Predynastic culture in the Nile Delta. *Nature*, **363**: 435 – 438.

WENKE R. J. (1999) – Mendes, Predynastic and Early Dynastic. In: Bard, K. A. (Ed.), *Encyclopedia of the Archaeology of Ancient Egypt*. Routledge, London: 601 – 603.