A transdisciplinary approach to reconstruct the Nilotic socio-ecosystem in Luxor west bank during the Ptolemaic period (4th-1st centuries BC.)

G. Nicatore, Phd student, Université Paris I Panthéon-Sorbonne, UMR 7041 ArScAn, Équipe “Archéologies environnementales”, France

C. Petit, Professor, Université Paris I Panthéon-Sorbonne, UMR 7041 ArScAn, Équipe “Archéologies environnementales”, France
Presentation of my formation

• 2010/2012: Master's Degree in Classical Letters, University of Milan
  o Master's thesis in Egyptology

• 2012/2013: Master in Preventive Archaeology, University of Siena (Italy)
  o Dissertation in computer science applied to Egyptology

• 2017/2018: Master 2 in Environmental Archaeology, University Paris 1 Panthéon - Sorbonne
  o Dissertation: The intersection of demotic and geomorphological data: study of the environment of the west bank of Luxor (Egypt) during the Ptolemaic period

• 2019-present: PhD in Environmental Archaeology at the University Paris 1 Panthéon-Sorbonne
Study area: Luxor west bank and the Memnoneia in the Graeco-Roman period

- Ptolemaic period: from 332 BC to 0

Sources: on the left, Map of Ancient Egypt, Bard 2015, p. 48; on the right, the study area, Google Earth Pro, 25/02/2021
Available data for the study area

Carte de Thèbes, Jollespin, Description de l’Egypte, V. II, planche 19, 1821-1829

Landsat image of the Thebaid, https://landsat.gsfc.nasa.gov/

Google Earth Pro, 30/01/2018

Lithological profile of the west bank of Thebes, Toonen, Graham, Geoarchaeology 2017, p. 6

Session 2 - Occupation of territories and population mobility
Issues approached through cross-referencing of data

• How was the river managed?
  o Management analysis of all water resources; the Nile's dynamics

• How was the agricultural exploitation of the plain structured?
  o Identification of the network of irrigation canals; soil and subsoil analysis; location and size of fields mentioned in the contracts

• What form the organization of the settlement takes?
  o limits of the village of Djeme; relating to the landscape all the topographical elements cited in the papyri

Achieving a detailed description of the overall evolution of the socio-ecosystem of the study area and not only of an isolated archaeological site
Selected data for the analysis

• 33 Demotic and 2 Greek land sale and lease contracts:
  o from 332 B.C. until the end of the first century B.C.;

• maps of the west bank of Luxor:
  o from the Description de l'Égypte (Royal edition, 1821-1829) to the most recent satellite and aerial images;

• geoarchaeological data:
  o geomorphological data already acquired by other archaeological missions
  o geophysical mapping of the plain that we planned.

Chronological distribution of texts

- 332 - 200 BC: 6
- 200 - 150 BC: 11
- 150 BC - 0: 18
An example of the methodology: lexicographic analysis

- Combining papyrological and geophysical data
An example of the methodology: georeferencing modern maps

- **Methodology**: georeferencing and comparing maps with GIS tool
  - Comparing the human/environmental changes produced over the course of a century
  - Understanding the evolution of the *Memnoneia* sector and how the agrarian reform of Muhammed Ali changed the environment

*Figure 1. P. Jacotin 1821-1829*  
Georeferencing a geographical map

*Figure 2. G. Schweinfurth, 1914*  
Georeferencing a topographical map
Geoarchaeological part of the project

• Using existing data

Toonen et al., 2018, *Geoarchaeology* 33, p. 276

1) An inscription in the Temple of Karnak (east bank, Luxor) mentions a sacred mound, also called the "Mound of Djeme," from which water flowed before the Nile flooded. "The great entrance to the "Noun Cave" [= the underground waters] on the west bank of Heaven (= Thebes) at Khefetherennebes.

2) Herodotus, II, 93, 5: "[...] the hollow parts of the country and the lagoons parallel to the river begin first to fill, the water coming from the Nile by infiltration.»

• Acquiring new data

- Three-dimensional geometry of the alluvial forms
- Mapping of the electrical conductivity of the plain

Device EM31-MK2 - www.georeva.eu
Conclusions

• Reconstruction of the microtopography of the region during the Ptolemaic period
  o Visualization as complete as possible through a geographic information software

• Future perspectives
  o Applying the methodology in others part of Egypt presenting the same abundance and variety of data
Thank you for your attention!

Q/A Time