# “ Going back to Medamud : Excavation feedback on processing, interpretation and planning ”

Thiesson Julien, Félix Relats Montserrat

# NEW GLOBAL PERSPECTIVES ON ARCHAEOLOGICAL PROSPECTION

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Cover images:

Top Left: Earth resistance data from a circular ditched monument SL014-209041-, Carrowmore Megalithic Cemetery, Co. Sligo.
Top right: Electromagnetic induction survey of a fulacht fia, monument SL008-205----, Coney Island, Co. Sligo. Photograph: Ciarán Davis
Bottom left: Megalithic Passage Tomb, monument SL014-209006-, Carrowmore Megalithic Cemetery, Co. Sligo
Bottom right: Court Tomb, monument SL015-050----, Deerpark, Co. Sligo



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# Going back to Medamud: Excavation feedback on processing, interpretation and planning

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## Introduction

This study follows the work previously done on the site of Medamud (Relats *et al.* 2016: 325-384, Thiesson *et al.* 2017: 245). One of the results was a map of archaeological features obtained in combining various apparent geophysical maps (mainly conductivity and susceptibility at various depths and magnetic anomalies). These maps where used to guide the excavation planning in an area that had never been excavated. This paper will address the comparison between the maps obtained in 2015 and the results of the excavation carried out from 2017 to 2019. It will show the issues that we encountered and discuss how the excavation helps enhance the integration of the geophysical data in the archaeological understanding of the site.

## Excavation and archaeological results

Exploration of the Medamud site took place mainly between 1924 and 1940 (Relats *et al.* 2016). During these times, the first excavators focused on stone masonry and left the brick structures surrounding the sanctuary. The nature of the latter was investigated thanks to a pedestrian survey that showed a significant number of over-fired ceramics and firing waste. It strengthens the existence, in Medamud, during antiquity, of a ceramic workshop sector.

In addition to the archaeological contribution offered by geophysics in an unspoiled context, the following points guided our reflection:

- the probable presence of kilns presenting a strong magnetic signal
- the vicinity of the temple leading to a road network - constituted of mud brick walls - offering a clear contrast

As a result, it was clear that the geophysical response should be a source of reflection rather than a solution to compensate for the absence of excavations. Among the areas surveyed in 2015, we initially focused on the M4/K9 zone, which contained the largest surface area and was closest to the temple. The objective of the 2019 excavation was therefore to understand the organization of urban planning and crafting activity in the area near temenos, while verifying the geophysical results.

According to the data, which illustrates the existence of a large mud brick structure crossing the area from east to west, it was decided to open a 33m by 10m trench, oriented north-south (Fig. 1a). In this area, several archaeological structures were found, linked to an artisanal area, including several kilns, mudbrick walls and some ill-defined features linked with the kilns and building collapse (not shown).

## Comparison with the 2015 synthetic map

A synthetic map (Fig. 1b) based on the geophysical results obtained by magnetometry and electromagnetic induction (EMI) demonstrates a cross positioning problem. It appears that the geographical coordinates obtained for the 2015 survey are not equal to the ones in current use for the excavation and site survey. As they were derived from points measured with a handheld GPS receiver with a 3m-10m absolute error, this was not totally unexpected. However, as the geophysical surveys are an important part of the Medamud archaeological study, corrections were required. We decided to use the excavation results to identify the features to their corresponding anomaly in order to correct the positioning of the 2015 maps. Furthermore, additional detailed surveys also helped to calibrate the synthetic interpretation based on the geophysics.

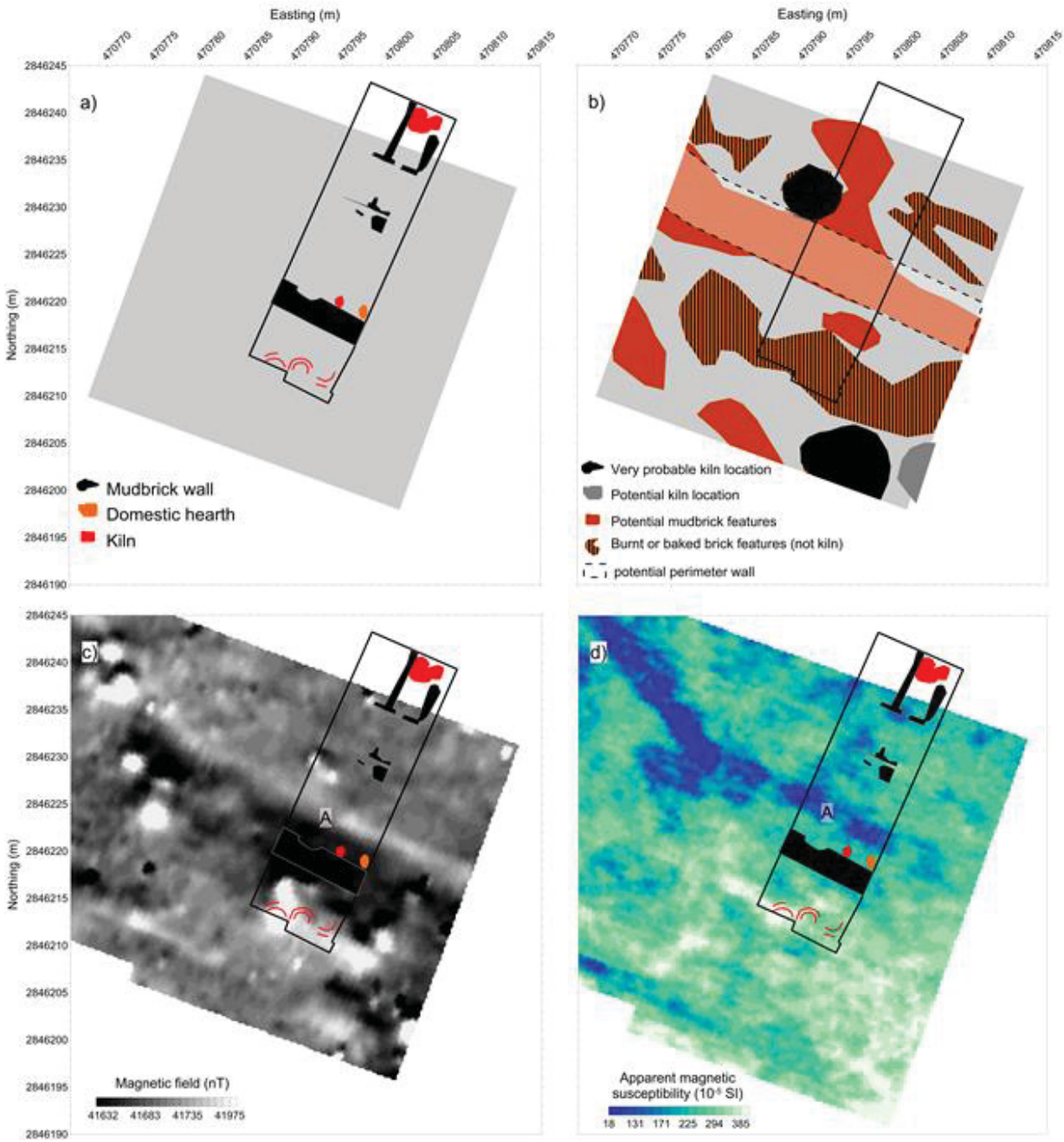


Fig. 1. a) the simplified archaeological results of the area excavated in 2019, b) the geophysical driven synthetic map proposed in 2016, c) the magnetic field map obtained in 2015, d) the apparent susceptibility map obtained in 2015.

*Identifying excavated features to calibrate the positioning*

As several features on the synthetic map could correspond to the ones excavated (and vice versa), we need to evaluate the values of magnetic susceptibility for the features excavated in 2019. It appears that the expected mud bricks wall corresponds well in susceptibility to the feature identified as A (Fig. 1c, 1d). Based on the hypothesis that this feature did not move between 2015 and 2019, we computed the X and Y offsets needed to correct the coordinates of the 2015 surveys.

*Detail mapping of an area*

As the archaeological features are covered by pottery sherds up to 1m thick, we conducted another experiment. We repeated twice the measurement over the small area south of the southern mudbrick wall. The first time, the first 0.15m was excavated. Then, after the measurement, another 0.15m was excavated. We obtained two maps of the same area giving some clues on the magnetic susceptibility of the features.

*Testing TDR measurements*

In addition, some TDR measurements were carried out over some of the features in order to evaluate the interest of using dielectrical permittivity for further surveying and interpreting based on geophysical surveys. We used a Hydrosense 2 from Campbell Scientific with a 0.12cm probe. The devices give a time in µs which is linked to the permittivity. The device was quite hard to stick in the ground mainly due to the large amount of pottery sherds. Table 1, below, shows qualitative results other some well identified features. The results suggest that it could be useful for some finer discrimination.

| **Archaeological feature** | Mudbricks (well-shaped) | Yellow mudbricks (ill-shaped) | Black mudbricks (ill-shaped) | Upper filling (with shards) |
|---|---|---|---|---|
| **Time in µs (linked to electrical permittivity)** | 1.831 to 1.942 | 1.337 to 1.659 | 1.780 to 1.822 | 1.182 to 1.681 |

Table 1. Ranges of times (linked to apparent dielectrical permittivity) for some identified remains.

## Conclusion

This paper aims to show some feedback on the synthetic map obtained over the Medamud site. The measurements exhibit some issues concerning the positioning of the 2015 geophysical map in the actual coordinate system of the site. The measurements over some excavated features permit to correction and ensure that further planning based on the geophysical survey should be accurate.

It also means that the threshold values taken for the synthetic map should be reassessed (in 2015, they were based on a statistical assumption only). An important step consists in measuring the properties directly on the features excavated. In addition to magnetic susceptibility, the opportunity was taken to test dielectrical permittivity as another discriminating parameter for future survey, but it gives very patchy results mainly due to the difficulty of sticking the probe in to the surficial pottery sherds. The choice of relevant parameters, as it is site dependent, must be tested and validated during the whole archaeological campaign. Unfortunately, we could only use magnetic susceptibility and dielectrical permittivity which are a sparse sample of the geophysical parameters that could be measured over the excavated features.

## References

Montserrat, F.R., Thiesson, J., Mendieta, Z.B., Sanchez, C., Rejiba, F. and Guérin, R. 2017. Une première campagne de prospection à Médamou: méthodologie et résultats préliminaires (Mission Ifao/Paris-Sorbonne/Labex Resmed de Médamoud). *Bulletin de l'Institut Français d'Archéologie Orientale du Caire*. 116. 325-384.

Thiesson, J., Montserrat, F.R., Sanchez, C., Guérin, R. and Réjiba, F. 2017. Prospection at the Medamud (Egypt) site: building archaeological meaning from the geophysical in situ measurements. In Jennings, B., Gaffney, C., Sparrow, T. and Gaffney, S. (eds.) *AP2017. 12th International Conference of Archaeological Prospection*. Archaeopress. Oxford. 245.