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Gold mining in Early Ptolemaic Egypt

The first campaign in the Samut district of the Eastern Desert took place in January 2014. Two main sites excavated by the French team, conducted by **Bérangère Redon** and **Thomas Faucher**, are a fortress and a mining district. They date back to the beginning of the Ptolemaic Period and their construction is closely linked with the exploitation of gold mines nearby.

Gold was plentiful in Egypt and had been used by the pharaohs as a means of asserting their power. Abundant particularly in the Eastern Desert (in a wide definition, including the Northern Sudan), gold is mined in the area as early as the Predynastic Period. From the Old Kingdom onward, campaigns are launched by the pharaohs, taking the form of seasonal, often short-lived operations. They are at first limited to the search for alluvial gold in the wadis, but progressively gold quartz is also extracted from visible veins. The New Kingdom is a period of development for these activities; it is in the Ptolemaic Period that the state initiates for the first time a systematic and intensive exploitation of the Egyptian gold-bearing veins, to consolidate its power and pursue an ambitious foreign policy. This intensification is also made possible by the use of iron tools, replacing lithic tools, and more efficient grinding mills. The Roman era is a period of decline and the next peak in activity occurs in Omayyad. times. The last renewal of the gold mining is modern and a gold rush has been occurring in the region since the revolution of 2011, with a deep impact on the area's heritage.

As for Antiquity, while the continuous use of gold in Egyptian art has produced a considerable literature, the actual history of Egyptian gold – the mining, the production, the circulation – is a lot less well known. Of course, surveys have been conducted in the area since the 19th century by pioneer travellers and geologists (Linant de Bellefonds, Benzoni, Wilkinson, and others), followed by more scientific missions (led by G. Castel, H. Wright, S. Sidebotham, or D. and R. Klemm). But so far no stratigraphical excavations of a gold mining site have been conducted, except at the mainly Byzantine site of Bi'r Umm el-Fawakhir by the Oriental Institute of Chicago in the 1990s.

The research project of the French mission of the Eastern desert aims to fill these gaps in our knowledge through the excavation of Samut, a key gold mining district dating back to the Ptolemaic Period, located between Edfu and Marsa Alam. This site has never been explored before and holds crucial data for the understanding of the history and archaeology of Egypt's gold during one of its major peaks of exploitation.



General view of Bi'r Samut from northeast. (Photograph by J.-P. Brun, 2014.)

The district of Samut is organised around two main sites, Bi'r Samut and Samut North. Faced with recent destructions, we had to conduct salvage excavations on both sites in January 2014, a change to our original plans, which was to study one site after the other.

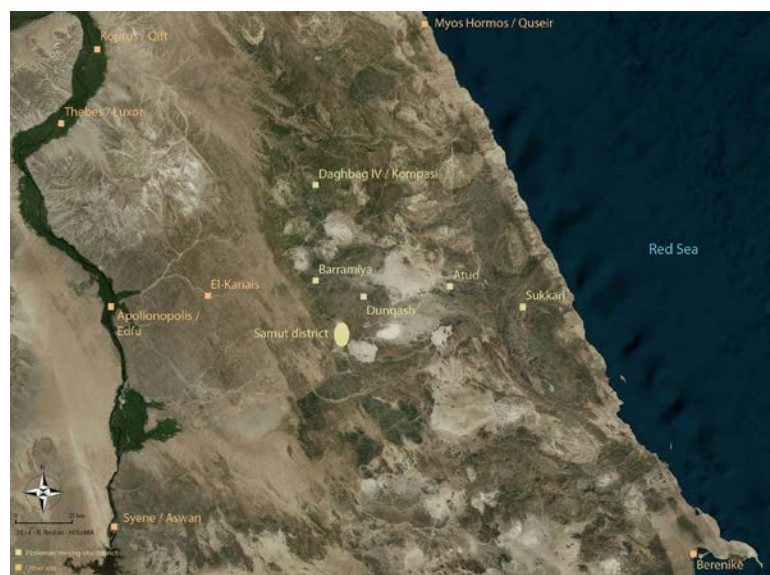
Bi'r Samut is a Ptolemaic fortress located in a wadi, at one of the ancient roads leading from the Nile Valley to the Red Sea. It is known since the 19th century and has been drawn by Wilkinson in 1818. Rectangular in shape, measuring 68 x 59 m, the fort was secured by

four angle towers (of which three remain) and two gates. While we did not excavate its inside this year, it probably held, among other facilities, a well ('bi'r') that has given the site its name.

In 2014, J.-P. Brun excavated the two rubbish dumps located northeast and northwest of the fort, close to the gates and in great danger of looting. They were particularly rich in ceramics (studied by J. Gates-Foster) and ostraca (389, written both in Greek and demotic, have been registered by A. Bülow-Jacobsen, M.-P. Chaufray, H. Cuvigny). With the few coins discovered in the same context, they show that the fort was occupied in the Early Ptolemaic Period (but probably later than at North Samut) until the end of the 3rd century BC. So far no connection with any gold-mining activity is mentioned in the ostraca, which deal mainly with food and water distribution.

North Samut is located 5 km to the north. Far less known, except from recent descriptions by S. Sidebotham, and D. and R. Klemm, it is the heart of the Ptolemaic gold exploitation area, centred around its main mine. It consists of a quartz vein visible from the surface, exploited for a stretch of 277 m. Ancient works can clearly be seen, in the form of a surface trench, the upper part of which is empty. The lower part is full of stones and sand, and did not allow a complete view of the ancient activities. However, an underground survey has been conducted by Fl. Téreygeol, A. Arles and J. Gauthier in four shafts, their depths ranging from 13 to 64 m. Ptolemaic works are observable only in the upper part of the shafts, between the surface and a depth of 18 m. The trench was exploited from the surface continuously on a 10 m-stretch, and several galleries can be observed in the lower part. Below 18 m, mining activity is definitely modern, probably carried out by a British company that worked in Samut in 1903.

One hundred metres southeast stands the main structure of the area (n° 1 on the plan), measuring 58 x 36 m. Its four wings were rationally organised: the western one housed the kitchen (fig. 8) and probably a dining room;



the southern one accommodated a possible chapel with a small mastaba and several storage rooms; amongst the discoveries, mainly amphora, was a complete lead bowl still containing lentils, as identified by Ch. Bouchaud. The northern wing has not been completely excavated but its high position, the size of the rooms and the finds could indicate that it was the major's quarters; finally, the eastern wing comprises three intriguing rooms, oblong, divided into three spaces by low walls and guarded by a gatehouse near their narrow entrances. Pottery and fragments of quartz have been found there in significant numbers, as well as a crusher and stone tools for the miners. These spaces might have been living and working quarters for some of the miners.

Area 2 (probably a dormitory for the workers crushing the quartz) has not been studied in 2014, as we focused on areas 3 and 4, which had partly been destroyed in 2013. These are located close to the vein and devoted to the mining process: here the quartz rocks, taken from the mine by the miners, were crushed and reduced to powder; this was then washed out, leaving behind the

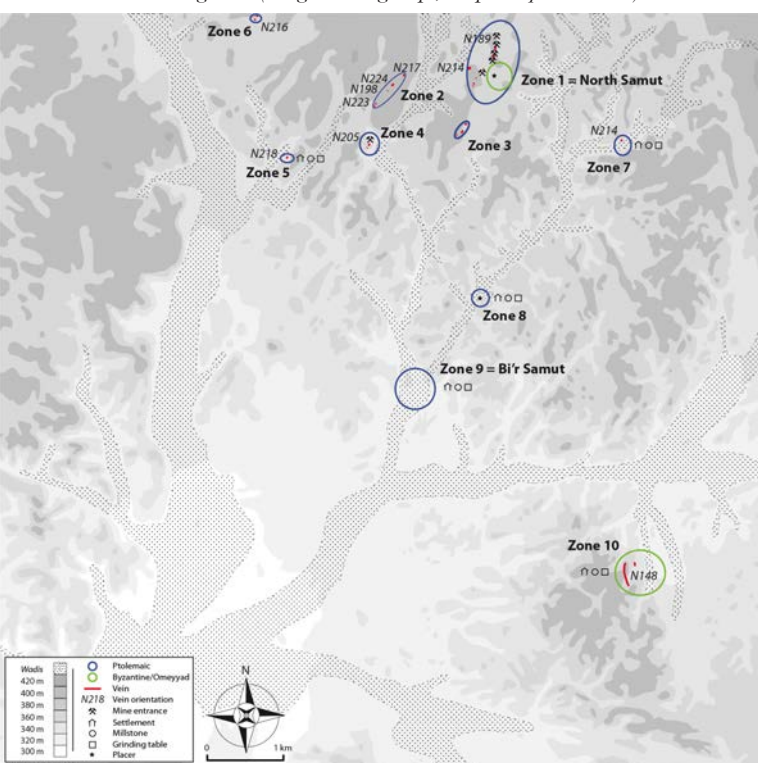
gold, as described by the Greek geographer Agatharchides in the 2nd century BC. In particular, two heavy mineral processing plants (used to separate the gold from the sediment at the end of the process) have been cleared. They were mentioned by D. and R. Klemm, who compared them to devices discovered at the Laurion, Greece. Our own partial excavations, however, revealed some dissimilarities and further excavations are needed to better understand their function.

The pottery of North Samut has been studied by J.-P. Brun. It comprises mainly local cooking vessels and amphora, and several



View of the two heavy mineral processing plants. (Photograph by A. Bülow-Jacobsen, 2014.)

Left: satellite view of the Eastern Desert, with the main Ptolemaic settlements and mining sites. (Image © BingMaps, adapted by B. Redon.)



Above: general plan of the Samut district with location of the mining activities and settlements. (Drawing by Th. Faucher, 2013.)

lamps of similar forms; bearing initials, these might have been miners' lamps. Only 14 ostraca have been discovered in Building 1, of which one indicates that the amphora contained 368 black figs sent to a banker. All the material dates to the reign of Ptolemy I.

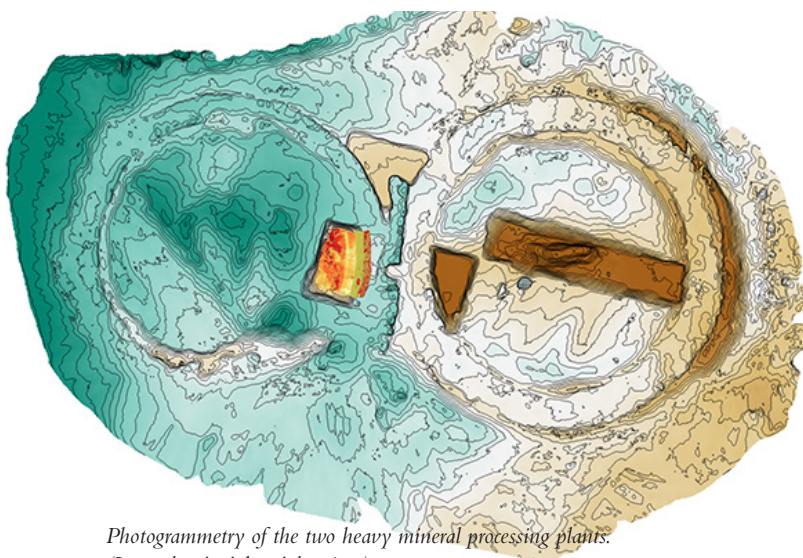
The stratigraphy of the remains excavated in 2014, as well as the observations made in the mine itself, show that Samut North had been occupied only very briefly, maybe for less than 10 years, while Bi'r Samut's occupation was later and lasted longer. It raises many questions about the massive and disproportionate investment made by



Underground exploration of the Samut North mine. (Photograph by A. Bülow-Jacobsen, 2014.)

Ptolemy I in the Samut gold mine for such a short period of activity. The chronological discrepancy between the two settlements is also intriguing. Hopefully, further excavations will bring answers to these issues. However, exceptionally well preserved until recently, the two sites were seriously damaged in 2013. At Bi'r Samut, a big pit has been dug at the main entrance to the fortress and the gate destroyed. Furthermore, several locations on the site were attacked by looters, in particular the southwest corner of the fort and a part of the dump next to it. These actions are clearly connected to recent and illegal activity of diggers, looking for gold in the Eastern Desert and in particular near the ancient sites. At North Samut, a mining company planning to reopen the mine was allowed to make deep boreholes to analyse the mineral content of the remaining quartz, causing damages in areas 1 and 3. All these destructions are a great loss for the archaeology of Egypt, and the site – as well as many others in the Eastern desert – is clearly in danger of disappearance over the next year should it remain unprotected.

□ Bérangère Redon (CNRS-HiSoMA, Lyon) and Thomas Faucher (CNRS-IRAMAT, Orléans) have been the director respectively deputy director of the Eastern Desert mission since 2013. The mission is funded by the French Foreign Office and the French Institute of Oriental Archaeology (IFAO), with the participation of the CNRS and the Collège de France. We thank the Ministry of Antiquities for their authorisation and help. Images: © The French Archaeological Mission of the Eastern Desert.



Photogrammetry of the two heavy mineral processing plants. (Image by A. Arles, Arkemine.)