

Interim report of the activities on Qaitbay site, Alexandria during the year 2018

For reasons related to the issuing of permits from various authorities, the underwater campaign took place over three periods, from 31 July to 19 August, from 14 September to 14 October and from 11 November to 20 December 2018. The weather was generally bad, and at the end of the mission there was zero visibility due to the construction of a breakwater around Fort Qaitbay, a short distance from the ancient site. As every year, the programme was divided between underwater photography of the areas that had not yet been processed in order to complete the Digital Surface Model (DSM), with the implementation and survey of reference posts for georeferencing, and shots of underwater architectural fragments, for 3D reconstruction by automatic digital image-correlation photogrammetry.

1. Photogrammetry of the monumental site

Photogrammetry of the site was carried out in two areas. In zone 2, northeast of the site near the relocated blocks 2397 and 2414, 470 square meters were covered (**fig. 1 [a]**). Southeast of the site, an area along the wharf with concrete blocks (570 m²), that mainly consist of column drums, was photographed – after the setting up and survey of the new topographic markers; it was then modelled (**fig. 1 [b]**). This area is a high priority area because of the ongoing conservation work at Fort Qaitbay. In total, about 8,000 square meters have been covered, nearly 62% of the site (**fig. 2**).

2. Photogrammetry of individual blocks

The preliminary work before photography of the blocks involves finding the individual blocks in an environment that changes from one year to the next. Blocks weighing less than 6 tonnes can move a few meters during heavy winter storms. Once found, the blocks are cleaned, and the length of time that takes depends on the particular decorations or inscriptions. In 2018 the work focused mainly on the acquisition of hieroglyphic blocks to complete the documentation for G. Soukiassian's forthcoming publication.

The following blocks were located, cleaned and photographed, and turned over when possible so that they could be modelled.

- CEALex 408: block belonging to the framework of an opening with mortises and a pour channel on the bedding surface and a square mortise on the resting surface; in a second phase, the digging of a deep circular cavity on the resting surface (**fig. 3a–b**). During the cleaning of the square mortise of the resting surface, five bronze coins (**fig. 4**) were unearthed and were preliminarily dated to the medieval period (12th–16th century)¹.
- CEALex 1024: monumental base in pink granite;
- CEALex 1229: block inscribed with hieroglyphs;
- CEALex 1605: circular column base inserted into a floor slab with 6 wedge holes for cutting the block for its re-use;
- CEALex 1651: inscribed quartzite block;
- CEALex 2180: papyriform column fragment;
- CEALex 2397: fragment of granite stele with a statue carved into it, cut at the ankles; traces of cutting on the long edges of the fragment;
- CEALex 2414: fragment of granite stele with statue built up against it, traces of cutting on the long edges of the fragment;
- CEALex 4152: moulded corner block;
- CEALex 4187: diorite block with triglyph and metope (**fig. 5**)
- CEALex 5177: base of Egyptian column in a floor slab; trace of a square hole on the bedding surface;
- CEALex 5274: block inscribed with hieroglyphs;
- CEALex 6202: fragment of reposoir of Anuket

Other blocks have not yet been located: CEALex 2174, cornice block inscribed in the name of Ramses II, CEALex 2371, fragment of the pelvis of a statue.

In December 2018, there were 125 blocks (53 submerged blocks on the underwater site and 72 brought to the surface) available for photogrammetry, with different finishing effects (see **appendix**). For the blocks that were brought to the surface, two are stored on the East Harbour wharf, 20 on the site of the Kom el-Dikka Roman Theatre, three at the Alexandria Maritime Museum, one in front of the Library of Alexandria, and 46 in the store rooms of the Tabiet el-Nahassin. Nine monuments have been created from the work of matching the architectural or statuary blocks.

¹ Identification Th. Faucher.

3. Study of the statuary unearthed at the foot of Fort Qaitbay

Advances in photogrammetric documentation have reopened the records of statuary found at the foot of Fort Qaitbay. François Queyrel, sculpture specialist and professor at the Ecole Pratique des Hautes Etudes in Paris, took responsibility for the description and commentary of the Pharaonic-type royal Ptolemaic statues and two large granite bases. The catalogue includes a couple of colossal statues 9–10 m high, a second pair of colossal statues 6 m high, a third couple of colossal statues 4 m high. In addition, there is a male statue and a female statue of life-size. The use of Meshlab software enabled the reconstruction of the 6 m high female statue from four elements that were previously attributed to two different statues. The study also demonstrated that the granite bases did not belong to the colossal statues, since the seal traces on the bedding surface of the bases do not fit with such granite statues. The identification of the iconographic schema and the material from the missing statues is in progress.

4. Training and outreach

Training

Yves Egels, Professor Emeritus at the Ecole Nationale des Sciences Géographiques and a specialist in photogrammetry carried out a mission in May 2018, to share with the team the latest advances in the field, to validate the protocols used in underwater, terrestrial and underground situations, and to validate the models produced (assessment of calculation errors, interpretation of photostan reports).

Conferences

Mohamed AbdelAziz, currently doing a Master's degree at Alexandria University under the direction of Professors Rania Moustapha and Jean-Yves Empereur, presented the results of the photogrammetry of the site and selected blocks at the conference of the 69th Annual Meeting of the ARCE (Tucson, Arizona): 'Photogrammetry and 3D technology in Archeology: applications on some archaeological sites in the city of Alexandria'.

Isabelle Hairy presented "Bilan sur les dernières recherches sous-marines sur la côte d'Alexandrie" during the round-table discussion *L'archéologie de l'hellénisme dans les îles et*

sur les côtés de la Méditerranée orientale au Ier millénaire av. J.-C. Bilans récents et perspectives, organized by the Société Française d'Archéologie Classique on 17 March, 2018.

Publications

Isabelle Hairy and Jean-Yves Empeur have submitted their contributions to the conference *Under the Mediterranean* organised by the HFF and the University of Cyprus that was held in Nicosia in October 2017. Their contributions are entitled:

“Honor Frost and the Alexandria Lighthouse”

“The Evolution of Survey Techniques on the Qaitbay Underwater Site at Alexandria, Egypt”.

Four volumes are in progress:

Nicolas Boichot, *Les amphores Lamboglia 2 dans le bassin oriental de la Méditerranée: production, typologie et diffusion* (forthcoming end 2019)

Isabelle Hairy, *Rapport sur la fouille sous-marine de Qaitbay* (forthcoming 2020)

François Queyrel, *La statuaire mise au jour au pied du fort Qaitbay* (forthcoming 2020)

Georges Soukiassian, *Les blocs hiéroglyphiques mis au jour au pied du Fort Qaitbay* (forthcoming end 2019).

Television programmes

In November 2017 a documentary team from Mallinson Sadler Productions, commissioned by National Geographic and directed by Sophie Elwin Harris, came to film an episode in the series *Drain the oceans*. The documentary was released at the beginning of 2019.

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Fig. 1. Pharos site. Location of the two new sectors identified in 2018. a) northeast b) southeast. © CEAlex / Cnrs Archives.

Fig. 2. Pharos site. Photogrammetry of the monumental site at the end of the 2018 campaign. © CEAlex / Cnrs Archives.

Fig. 3a. Pharos site: 3D model of CEAlex 408 block with view of the bedding surface of the block in its first use. Photo Soubias, © CEAlex / Cnrs Archives.

Fig. 3b. Pharos site: 3D model of the CEALex 408 block with a view of the resting surface of the block in its first use and the hole dug during re-use. Photo Soubias, © CEALex / Cnrs Archives.

Fig. 4. Pharos site: details on the coins found in the square mortise of the resting surface belonging to the first phase of the CEALex 408 block. Photo Soubias, © CEALex / Cnrs Archives.

Fig. 5. Pharos site: metope and triglyph block CEALex 4187. Photo Soubias, © CEALex / Cnrs Archives.

Appendix: List of blocks that were the subject of a photogrammetric survey at the end of 2018.