

The Underwater Archaeological Surveys of the Greek Mission in Alexandria, 1998-2012. Fifteen years of uninterrupted research

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Introduction

The idea of building a capital for the empire he was forming must have been in Alexander's mind well before the year 331 B.C. when he undertook a long and perilous voyage to the oasis of Siwa in the Libyan Desert. The aim of this voyage, was to ask three specific questions to the oracle of Amon-Zeus: Was he the son of that double horned god? Would he be allowed to rule the oikoumene? Had all the responsible persons involved in the murder of his natural father Phillip been punished?

One can only wonder why Alexander decided to put forward these questions personally instead of sending a delegation; and why he particularly choose the oracle of Siwa when he could have consulted the well-known Egyptian oracle of Amon-Ra in Thebes. By choosing Siwa, an out of the beaten track oasis, not far from Paraetonium¹, where Greeks had settled centuries before, Alexander wanted to stress that amalgam of Greek and Egyptian religion and culture that would have a vital role in his political planning.

On his way to Siwa Alexander stopped at a narrow strip of land located not far from the western estuary of the Nile River, lying between the Mediterranean Sea and Lake Mareotis, where a small elongated island called Pharos known to the Greeks since Homeric times provided limited shelter from the northern winds for a small settlement of fishermen called Ra-he-te by the Egyptians, known as Rhakotis to the Greeks. It is there that Alexander decided to build a new city destined to bear his name and become his capital. The selection of that site surrounded by a flat land free of any buildings, would offer Dinocrates, Alexander's town planner, the opportunity to build a megapolis following the hypodamean concept of a modern town featuring large avenues and streets intersecting at right angles. Contrary to other capitals that played an important role as administrative and cultural centers of the ancient world, and which had developed by expanding from an earlier, often prehistoric nucleus of dwellings, Alexandria was planned to function as an expanded capital right from its foundation.

Greek towns were named after gods, goddesses or heroes; Alexandria would be the first urban agglomeration to take its name after a conqueror king. Another novelty was that from its foundation this capital of the largest empire ever formed to that day, would be a cosmopolitan city. The Macedonian settlers and the Greeks in general were allocated within the central part of the new city, where the Bruchium, the Royal

¹ Today's Marsa Matruh.

quarter were to be constructed, while the Western part populated by natives included the Acropolis of Alexandria focusing on the Sarapeum, the religious centre dedicated to Serapis a divinity representing a cross-breed of Egyptian and Greek belief. But the Jews and the Levantines would also have their share in the wider area of Alexandria: the eastern part of the city, the quarter known as “Delta”, would accommodate them as well as other dwellers coming from the East.

That cosmopolitan spirit was also notable in the religious beliefs of all those inhabitants of the megapolis: The temples of Serapis and Isis coexisted with shrines devoted to the Greek divinities and it should be remembered that some of the largest Jewish synagogues were to be built in Alexandria in the coming years.

Alexandria was intended to be a cosmopolitan city, with a predominant Greek appearance and culture and Greek was established and predominated as the official language for a thousand years².

As its roman appellation rightly indicates, Alexandria was a city adjacent to but separate from Egypt, it was not exactly Egypt, it was *Alexandrea ad Aegyptum*. A traveler reaching Alexandria could say: ... now I will proceed to Egypt.

A natural anchorage at the island of Pharos, giving shelter to small vessels must have existed centuries before Alexander's arrival and it is laconically mentioned by Homer³. There have been many conjunctures, but little evidence as to the importance of this primitive haven⁴.

One may wonder, when realizing the difficulties that ships faced in mediaeval times when entering the ports of Alexandria, why Alexander's town planner decided on such an inconvenient location. Why was the littoral of Rhakotis selected for his capital, a town that would greatly depend on its two sea ports⁵?

The Heptastade, a 1.200 m long bridge with a series of arches, connected the city to the Pharos Island forming thus two man-made ports. The Megas Limin, called *Portus Magnus*⁶ by the Romans and *Mina El Sharki* by the Arabs to the East and the *Eunostos*, the “Port of the Safe Return”⁷, the *Mina El Gharbi*, West, exclusively reserved for most of mediaeval times to Islamic ships. But the great number of reefs and shoals limited the access of these ports. The Eastern port in particular was most exposed to the predominant, often violent winds from the North and North-East. In consequence one wonders why the older and more favorably situated ports of the western end of the Delta were not preferred⁸. It is argued that these ports already used by the Greeks centuries before Alexander were exposed to the danger of being choked by the Nile mud

² For another half a century after the Arab conquest of 641 the Greek language continued been used as the official language.

³ Homer, *Od.* 4,351 – 4.369 “Ἐπειτα ὑπάρχει ἓνα νησί μέσα στη πολυκύμαντη θάλασσα, μπροστά από την Αίγυπτο, που το ονομάζουν Φάρο, τόσο μακριά όσο μπορεί να διανύσει σε μια μέρα ένα κοίλο πλοίο με πρύμιο τον καιρό. Εκεί υπάρχει εύορμος λιμάνι, από το οποίο ρίχνουν στη θάλασσα τα καλοζυγιασμένα καράβια, αφού αντλήσουν γλυκό νερό”. (Translation in modern Greek by Charalambos Kritzas). The Egyptian ports of the Mediterranean where known to the Greeks as early or even before the XIIIth century B.C.

⁴ G. Jondet, ‘*Les Ports antiques de Pharos*’, BSAA, no. 14, Alexandria 1912.

⁵ Lake Mareotis had also several port installations.

⁶ Referred also as Grand Port, Great Harbour and Port Neuf.

⁷ Also marked on maps as *Porto Vecchio*, *Port d’Asie*, *Port Franc*, *Portus Eunostis*, *Eunostis Portis*, *Port of Eunostos*, *Old Port*, *Port of the Galleys*, *Port d’Afrique*, *Port des Galères*.

⁸ The presence of settlements from the Minon period is well attested in the Nile Delta.

due to a current in the Mediterranean, beginning at the Straits of Gibraltar and washing the whole of the North African coast. This is certainly true and nowadays the geological aspects of both ports --Rosetta and Damietta-- have changed dramatically due to the alluvial silting and consequently have lost their importance. An additional negative point is that there is no substantial surface of land in between the Aegean Sea and the Alexandrian shores. Thus waves have free access and sweep through a vast sea area braking-up, unobstructed, at Alexandria's littoral⁹.

So why anyone should choose such a narrow strip of land between the sea and Lake Mareotis for the foundation of a metropolis that would have at short term inadequate ports¹⁰? There may be a plausible answer to this question as the geomorphology of the area at the time of Alexander was quite different from medieval Alexandria¹¹.

The marine remote sensing surveys carried out recently by the Laboratory of Marine Geology and Physical Oceanography, Department of Geology at the University of Patras¹² have shed light to the gradual geomorphologic changes of the approaches to the two ports of Alexandria. Side scan sonar, sub-bottom profiling and bathymetric data revealed the existence of a submerged barrier of reefs shaped in the form of a giant T (fig. 1). The direction is North West, with the upper horizontal arm running parallel to the Alexandria shore. The dimensions are circa 3,000 m for the horizontal formation and circa 2,000 m for the vertical. The depth of the horizontal arm obtained at 12m form a narrow planar strip. If it is assumed a rate of subsidence of about 3.5mm/yr then the depths at the top of this barrier of reefs were at only circa 4 m from the surface of the sea during the first part of the IVth century B.C. when Alexandria was planned¹³. This proposed average subsidence rate is within the range obtained at the subsidence rates obtained at archaeological sites in the Eastern Harbor (2.9-3.6 mm/yr) and Western Harbor (2.4-4.1 mm/yr) of Alexandria. According to the scenario of 8m of subsidence during the last 2300 years, this natural underwater formation was deep enough (some 4 m) to allow even large ships, with an important draft, to enter the ports although being a sufficient buttress precluding the full strength of the waves to affect the inner harbors. Man-made jetties also protected

⁹ The storm that hit Alexandria in December 2010 with high waves sweeping the Corniche and flooding a large part of the littoral is not an isolated incident. There are travellers' relations describing violent storms hitting the Eastern port, in particular, with disastrous consequences. An anonym Scott traveller in 1656 refers to a galleon loaded with 1000 tons of flax that was thrown on the rocs and wrecked notwithstanding the dropping of 16 anchors see Ouede Senoune, *Alexandrie et les récits de voyageurs du VII^e siècle à 1798*, Thesis at the Lyon University, 2008, p. 441. (Two volumes). Another case is reported in 1767 when forty vessels sunk or were washed away and broke on the shores because of a terrible storm see E. Yrwin, *Voyage à la mer Rouge, sur les côtes de l'Arabie, en Egypte et dans les divers déserts de la Thébaïde, suivi d'un autre de Venise à Bassorah, Alep, les déserts, etc., dans les années 1780 et 1781*, Paris 1792, p. 70.

¹⁰ The ancient port of Tyr, with an island bearing a resemblance to Pharos may have influenced Alexander's decision, see B. A. Groningen, 'A propos de la foundation d'Alexandrie', *Racolta di scritti in onore di G. Lumbroso, 1844-1925*, Milan 1925, p. 205-207; N. Marriner, J.-P., Morhange, C. Alexander, 'The Great tomolos at Tyre and Alexandria, eastern Mediterranean', *Geomorphology*, 100, 3-4, 2008, p. 377-400.

¹¹ Andrée Bernand however believes that the site was selected based on Aristotle's description of the "Ideal City", A. Bernand, *Alexandrie des Ptolemées*, Éditions CNRS, Paris 1995, p. 7.

¹² At the request of the Greek Mission, that is carrying out an underwater survey and excavations off the eastern coast of Alexandria and of the Centre d'Etudes Alexandrines, that is surveying the sea area north of Fort Quaitbay, the Laboratory of Marine Geology and Physical Oceanography, Department of Geology, University of the Patras has carried out a number of archaeo-geophysical surveys of the seafloor.

¹³ A. Chalari, G. Papatheodorou, M. Geraga, D. Christodoulou, G. Ferentinos, 'A marine geophysical survey illustrates Alexandria's Hellenistic past', *Zeitschrift für Geomorphologie*, vol. 53, no. 1, 2009.

the entrance of both ports leaving for each a narrow passage. Conveniently, the deepest waters, when approaching Alexandria, lay eastwards of this T shaped formation¹⁴.

It is known that since the time of the glaciers' last melting, circa 10,000 years B.P.T. the Mediterranean Sea rises by circa a meter every thousand years; in consequence it would be expected that this natural barrier should have been submerged in the year 600 A.D. by an additional meter and be at a depth of 5 m. However it was found that this immersion must have been more substantial because of the parallel existence of another natural phenomenon, earthquakes¹⁵, which affect the subsidence of the coast. So the expected one meter progressive immersion from the IVth century B.C. to the VIIth century A.D. has in fact more than doubled. Nowadays this barrier of reefs instead of lying, as it would be expected at 6 meters of depth is generally found at 12 meters.

There is no absolute uniformity in the subsidence¹⁶ of the Alexandrian coast, an example is that on the Codex Urbinate plan¹⁷ there are nine rocks/shoals, including 'El Hassan', protruding out of the sea while today, less than 600 years later 'El Hassan' lies at 12 m depth and the others, east of Silsileh, at 4/5 m. But a more dramatic testimony for the worsening conditions of the Eastern port is the great subsidence of the Diabathra; this extension of Cape Lochias that had a protective role acting as a buttress to the North and North East waves¹⁸. The long jetties which in ancient times closed the Eastern Harbor¹⁹ from the North did also disappear under sea level, leaving the Megas Limin wide open and totally unprotected. Ancient Cape Lochias

¹⁴ G. Papatheodorou, Chalari et Ali., 'Remote sensing in Underwater Archaeology : Case studies from Greece and Alexandria Egypt), 8th International Symposium on ship construction in Antiquity, Tropis VIII, Hydra, 2008; A. Chalari, Reconstruction of the natural environment of the coastal zone of Hellenistic Alexandria (Egypt) with the use of marine geophysical methods and geographical information systems [in Greek], Patras University, 2008, [Ph.D dissertation].

¹⁵ Twenty five catastrophic earthquakes were recorded in Alexandria from the year 320 B.C. to 2000; nine had its littoral as epicentre see M. Maamoun, A. Megaheb and A. Allam, 'Seismicity of Egypt', HIAG Bull. 4, 1984, pp. 109-160.

¹⁶ J.-P. Goiran, N. Marriner, C. Morhange, 'Evolution géomorphologique de la façade maritime d'Alexandrie (Egypte) au cours des six derniers Millénaires', in Mediterranean coastline geoarchaeology, *Environnements littoraux méditerranéens, Méditerranée*, 104, 1-2, 2005. pp. 61-64. See also publications of the French and the Greek Missions carrying out underwater archaeological surveys in the area: Jean-Yves Empereur, *Alexandrie Septième merveille du monde*, Paris 1996 and *Alexandrie redécouverte*, Paris 1998, pp. 64-81; Franck Goddio et al., *Alexandria the submerged royal quarters*, London 1998; Franck Goddio, 'Underwater archaeological survey of Alexandria's Easter Harbour', Coastal management sourcebooks 2, Underwater archaeology and coastal management, Focus on Alexandria, UNESCO, Paris 2000, pp. 60-63; Franck Goddio and Manfred Clauss (Eds), *Egypt's sunken treasures*, Munich 2006; for Harry Tzalas, Paolo Gallo and Kyriakos Savvopoulos see a list of publications on the surveys of the Greek Mission in addendum..

¹⁷ Jondet 1921, pl. I.; The rock called "Le Diamant" is shown on a print made in 1798 [*Expedition de l'Egypte, Antiquités vol.II*, Alexandria 3. pl. 87.] its top protrudes 6 m above water while now it is a shoal just at water level. This reduction of 6 m in two centuries is not due to a new subsidence but to the fact that before the bombardment of 1882 the British fleet levelled that rock, which stood in front of Quaitbay, to calibrate its guns. (Reported by Jean- Yves Empereur, excavator of the underwater area of the Pharos).

¹⁸ *Alexandrie, Plan de la Ville ancienne et moderne* in addendum to Evaristo Breccia *Alexandria Ad Aegyptum*, Guide de la Ville Ancienne et Moderne et du Musée Greco-Romain, Bergamo 1914. Although underwater surveys were not possible at the beginning of the 20th century when this plan was raised, amazingly most of the submerged structures of Acra Lochias, the Diabathra, the Royal Harbour, the Timonium, Antirrhodos and other sunken ancient remains in the Eastern and Western ports are more or less correctly marked. Some information is drawn from the excellent map made by Mahmoud Bey El Falaki, see Mahmoud Bey, *Mémoire sur l'Antique Alexandrie, ses faubourgs et environs découverts par les fouilles, sondages, nivellements et autres recherches*, Copenhagen 1872, also in Jondet 1921, pl. XXXVII. There is however on those maps an important divergence as to the real orientation of the Heptastade see HESSE, A., 'Arguments pour une nouvelle hypothèse de localisation de l'Heptastade', in J.-Y. EMPEREUR (Éd.), *Alexandrina 1, Études alexandrines 1*, Cairo 1998 and HESSE A. et ali, 'L'Heptastade d'Alexandrie (Égypte)', J.-Y. EMPEREUR (Éd.), *Alexandrina 2, Études alexandrines 6*, Cairo 2002, pp. 191-273.

¹⁹ The "Almadja" jetties built at the beginning of the 20th century, as a protection to the Eastern Port, stand mainly on the submerged remains of the ancient Diabathra.

became submerged and what remained visible of the promontory²⁰, called Silsileh at the end of the Middle Ages, is due to the constant filling of the gaps by dumping ancient architectural elements and other antiquities in a vain attempt to keep it above water level²¹. We can thus assume that during the early Mediaeval Times the slow disappearance of the Diabathra, as well as the piers and the promontory of Acra Lochias for the Eastern port, simultaneously with the piers and quays for the Western harbor –in addition to the substantial subsidence of that underwater protective T formation– allowed free access to the waves making more hazardous the entering and anchoring in both ports. The Eastern Port, because of its position was more notably affected and Christian ships could only use this harbor²². However that great subsidence of the littoral described above has not affected in the same manner a small port located at Sidi Bishr, some 10 km east of Alexandria. The portolan of Piri Reis (1518) shows this small haven set between the island of Gezira Gabr El Khour and the coast. Used by small boats until today it suffered a minimal subsidence, same as the island.²³

The question why did Alexander select for his new capital a position that was far from ideal for establishing its two ports has often been raised.

It is precisely those geologic phenomena which have greatly modified the geography of the approach to the ports of Alexandria and have affected the geomorphology of its littoral, that are also responsible for the presence of antiquities on the sea bottom. During an underwater survey one would expect to locate finds relating to maritime activities: shipwrecks, remains of ancient and mediaeval cargos, anchors. But the surveys carried out in the waters of Alexandria have revealed a vast amount of architectural elements which are lying in the shallows and in deeper waters as a result of the aforesaid geological disturbances.

But it is not only the forces of nature that are to blame for the destruction of the architectural heritage of Alexandria. The works of Man, wars and social unrest, have greatly contributed in denuding Alexandria of tangible remains as it has happened with many other cultural and political capitals of the ancient world. Athens, Rome, Constantinople have greatly suffered from similar vicissitudes but it is Alexandria that has the negative privilege of showing a nearly total lack of monuments that could bear witness to its glorious past. There is not a single, even faint vestige of a structure dating to the Hellenistic times, except for the sparse ruins of the Necropolises. The column of Diocletian, wrongly named after Pompey, the landmark of ancient

²⁰ The fractionation and partial disappearance of Silsileh promontory is well illustrated in numerous old maps and prints, see in Jondet 1921 plans and maps of : Razaud (1687), pl. VIII ; Melchier (1699), pl. IX ; Massy (1699), pl. X; Norden (1738), pls. XII & XIII ; d'Anville (1766) pl. XV; Savary (1785), pl. XVI, see also Description de l'Egypte (1798), pls. XVII, XVIII & XIX ; Reybaud (1801), pl. XXIV, Chaussard (1802), pl. XXV ; Walsh (1806), pl. XXVIII ; Smyth (1833), pl. XXXI; Le Saulmier de Vauhelle (1834), pl. XXXII and a view made in 1737 by Frederik Ludvig Norden, Travels in Egypt and Nubia, 1795.

²¹ It is at the end of the 1830's that Silsileh surface was levelled and unified as first shown on Napier's map of 1841 in Jondet 1921 pl. XXXIII.

²² Until the time of Mohamed Ali only Muslim vessels could use the Western port. The reason for this discrimination was allegedly that as this port was neighbouring with the new Ottoman town Christian seamen, hoisted on the tall masts of their ships, could have a free view of the native women who strolled unveiled in their houses. But according to another story the natives believed a legend that said that Iskanderiya would be taken by a fleet entering the Western port, Vivian Dominique Denan, Voyage dans la Basse et la Haute Egypte pendant les campagnes du Général Bonaparte, Paris 1802.

²³ The island of Gezira Gabr El Khour is now called Miami Island and faces Sidi Bishr n° 2 beach. See H. Tzalas, "The Underwater Archaeological Survey of the Greek Mission at the submerged Necropolis of Sidi Bishr, Alexandria, Egypt", ENALIA, XI, Athens 2012.

Alexandria, is a monument of the IInd century A.D. so besides that colossal pillar and the expatriated Pharaonic obelisks of the Cesareum there is no other reminder of the glory that was Alexandria.

The ruins of Alexandria's cultural and administrative center dating to Late Antiquity can only be seen in the restricted space of Kom El Dikka archaeological site.

Because of the scarcity of ancient remains the underwater excavations carried out by two French Missions²⁴ as well as by a Greek are of major importance for the topography of ancient and mediaeval Alexandria.

The survey of the Greek Mission

The Hellenic Institute of Ancient and Mediaeval Alexandrian Studies, Athens, obtained a concession from the Supreme Council of Antiquities of Egypt²⁵ in 1997, to survey the underwater coastal area of Alexandria extending eastwards of the Eastern Harbor [The Megas Limin of the Greeks – The Portus Magnus of the Roman - Mina El Sharki of the Islamic Times].

The area of the concession extends over 10 kilometers of littoral from Silsileh Promontory²⁶ to Sidi Bishr (**fig. 2**). The total surface is of 10 square kilometers, which is the most extended underwater archaeological area ever allocated to a single mission in all of the Mediterranean.

Although at some points the survey has been carried out at distances of 900 m from the coast our priority has been centered in the shallows. It is in the waters adjacent to the coast where --because of the rise of the Mediterranean and the subsidence of the Alexandrian littoral-- remains of manmade structures are nowadays submerged that our attention is focused. The depths of the locations surveyed vary from a few centimeters in the shallows to 28 m at the deepest point.

The Greek Mission, with the cooperation of the Department of Underwater Antiquities of Alexandria and of the Department of Marine Geology of the Patras University, in Greece, has carried out, from 1998 to 2012, twenty four campaigns. Another two are planned for the year 2013.

²⁴ The Centre d'Etudes Alexandrines, led by Dr. Jean-Yves Empereur has carried out for the last 20 years methodical underwater surveys on the site neighbouring Fort Quaid Bey, where some remains of the Pharos have been spotted. The other French Mission, is the Institut Européen d'Archéologie Sous-Marine led by Franck Goddio, for some of their publications see note n° 16.

²⁵ I would like to express my many thanks to the Supreme Council of Antiquities of Egypt as well as to the Department of Underwater Antiquities of Alexandria for their continued support.

²⁶ The Eastern littoral and its suburbs were known in antiquity as Eleusis [pros Eleusini thalassa], Nicopolis, Juliopolis.

In total, 65 divers of the Hellenic Institute²⁷ and 28 Egyptian colleagues from the Department of Underwater Antiquities of Alexandria were involved in the surveys²⁸. However another 110 scientists; archaeologists, historians, architects, restorers, draftsmen, marine geologists who are not divers supported this survey

The area of the concession has been divided into 7 sub-sites:

Sub-site **Chatby 1** is the most interesting and challenging, because it coincides with the submerged Acra Lochias that was part of the Βασιλεία, the Royal Quarters of the Ptolemaic Period and has revealed a varied and large number of architectural elements and artifacts.

Sub-site **Chatby 2** bears some remains that can be attributed to the large Proto-Christian church that stood on the site considered by the tradition to be the Martyrium of St. Marc. Besides surveying in the sea area, we also opened some trenches on the Chatby Beach that revealed a large amount of pottery sherds all datable to the 5th and 6th centuries AD.

Sub-site **Ibrahimieh 3** consists of a large reef, where a great number of mediaeval stone anchors have been found [over 60] as well as the lead components of a very large Late Hellenistic or Early Roman composite anchor.

Sub-site **Ibrahimieh 4** revealed the remains of a large stone quarry co-existing with some rock-cut burials. It could well be that that stone was used for the building of the walls surrounding the early Hellenistic city. Unfortunately, after our preliminary survey the area was completely reclaimed and the ancient quarry obliterated because of the widening of the Corniche road.

At Sub-site **Sporting 5** the remains of a large Necropolis in the shallows has been only partially covered by the Coastal Road widening and the dropping of concrete blocks, but our survey continues as remains of structures in deeper waters have been recently found.

Sub-site **El-Hassan 6** is a reef located at some 500 m North East of the eastern entrance of the Eastern Port, which was in ancient and mediaeval times a hazard to navigation. A large number of amphorae and pot-

²⁷ Mentioning all the names of my collaborators in the limited space of an article is impractical, but I would like to refer to those who have repeatedly taken part in our campaigns: the chief divers George Nomikos and Phaedon Antonopoulos, the archaeologists Irine Chrysoscheri, George Koutsouflakis, Theotokis Theodolou, Yiannis Nakas, Spyros Thermos, Thomas Iossifidis, Dimitra Theodoridou, the Egyptologist Dr Kyriakos Savvopoulos, George Papatheodorou, professor of Marine Geology at the Patras University, the architect-diver Silvana Gargiulo. My appreciation goes to Professor Paolo Gallo for studying the Pharaonic architectural elements.

²⁸ Several associations and individual persons have contributed financially to our campaigns, I will, for practical reasons, limit myself to acknowledging the main and regular sponsors: The J. F. Costopoulos Foundation, the Ministry of Culture of Greece, the Psychia Foundation, the Stavros S. Niarchos Foundation, Powertek Berhad, Port Said, East S.A.E, Suez Gulf S.A.E, Sidi Krir Generating Company, Mr. Ananda Krishnan of Kuala Lumpur and Mr. Andonis Nicolaras, Piraeus.

tery sherds were found witnessing to the presence of several ancient shipwrecks most of them dating to late antiquity.

At Sub-site **Sidi Bishr 7** the remains of what certainly was a very large Necropolis were traced. The remains of submerged burials extend from Gezira El Dahab (Gold Island) to Gezira Gabr El Khour (Miami Island).

The whole coastal and now submerged areas of this necropolis were used as a stone quarry at an undetermined period; what is preserved above sea level is a small portion of a large hypogeum with a semi-submerged corridor at the Sidi Bishr promontory (Bir Masaoud, or Devil's well) as well as remains of burials on the islet of Gezira Gabr El Khour. A vast area on the sea floor shows marks of quarrying activities and is scattered with numerous stone blocks.

A very brief description of what was found on each of the above mentioned sub-sites is given hereunder pending the final publication.

Chatby 1 is the location²⁹ of ancient Acra Lochias, where according to ancient sources there stood in Ptolemaic times, a palace, the temple of Isis Lochias and the Mausoleum of Cleopatra VII³⁰. Cape Silsileh, today's promontory, exists solely because in Medieval and Post-Medieval Times --until the beginning of the 20th century-- there was a constant filling of this subsiding, semi-submerged narrow strip of land in an attempt to maintain it above water and protect the eastern part of the Eastern Harbor with a sort of breakwater as a buttress to the action of the waves.

In the middle of the 16th century a small fortress called the Farillion was built and from the late 19th century the entire promontory is dotted with military installations.

An enormous amount of ancient remains gathered from the neighboring shores were dumped as filling material on what is today the Silsileh headland.

The geological³¹ and archaeological surveys conducted eastwards of Silsileh revealed that some 90% of the submerged surface of ancient Acra Lochias lies within the area of the Greek mission concession (**fig. 3 and 4**). Some 400 architectural elements: large blocks of granite and quartzite - plain or inscribed - blocks and slabs, broken columns, capitals, together with broken granite seats, stone grinders, millstones, and catapult projectiles as well as several unidentified pieces and pottery sherds are scattered on the sea floor.

²⁹ The name of the Chatby suburb is due to the tomb, or turba, of a holy man known as Sheih el Chatby. His funerary chapel was transferred eastwards, in the early part of the 20th century to a nearby location in the vicinity of St. Mark College.

³⁰ On his plan of 1898 G. Botti places on the Lochias Promontory a 'Royal Palace', the 'Temple of Isis Lochias' east of the tip, then south, near Chatby the 'Tomb of Cleopatra VII'.

³¹ Carried out by the Department of Marine Geology of the Patras University.

The largest are: a monumental granite base (**fig. 5**) of over 2 m in height³² the tower of a monolithic diminutive pylon weighing over 7 tons (**fig. 6**), five steps carved in a monolithic block of red granite (**fig. 7**) which gave access to that pylon, and the threshold of a monumental door (**fig. 8**) of an estimated weight of 11 tons. It should be stressed that the cavities of the threshold where the huge door rested have retained the brass supports and the lead fillings.

Because of their weight and their distance from the shores our assumption is that each of these elements marks the site of specific building and are not part of the transported material dumped in the sea as a buttress to the action of the waves. Nor can these heavy pieces be moved by the action of the waves and the swell, so they can be considered as being more or less in situ. The tower of the pylon is a unique find for Alexandria. There is no other pylon found in the city and in its immediate neighborhood³³. Because we know that pylons are related to sanctuaries and stand at their entrance, and as there was only one temple on Cape Lochias, the Temple of Isis Lochias, it would be reasonable to assume that this architectural element was part of that shrine. The tower is made of a single piece of red granite and no other monolithic pylon has been detected in Egypt.

That pylon tower has been transported for conservation at the Kom El Dikka Laboratory and is now exhibited at the site of the Polish Mission excavations in an area reserved for architectural remains retrieved from the sea (**fig. 9**). It is hoped that before long the monolithic steps which gave access to the pylon will be rejoined to that tower.

Because of the regulations imposed by the archaeological authorities³⁴, the threshold has been lifted for a preliminary study but was placed back on the sea bed. It certainly formed part of a monumental door circa 6 meters high. Possibly, it shows similarities with the entrances of some known Macedonian tombs in Northern Greece³⁵. According to ancient sources, interpreted by archaeologists of the end of the 19th century and the early 20th, the location of the Mausoleum of Cleopatra stood near or on the spot where that large architectural element lies today and further investigations may confirm the hypothesis that it was part of the Mausoleum entrance to that edifice. According to the same authors the Mausoleum was located very near to the Temple of Isis Lochias³⁶ as Cleopatra VII did regularly, during the critical moments preceding her tragic death, did regularly pray in that temple. The above architectural elements are lying on the sea-bed at a distance of circa 50 m from each other.

³² This base is comparable to another, nearly identical, found in the sea in the 1960's and exhibited in the garden of the Maritime Museum at Stanley.

³³ The nearest known pylons are those of Taposiris Magna at some 40 km west of Alexandria.

³⁴ There is lack of space in the Alexandria museums and archaeological sites; it is hoped that before long a new space for exhibiting large archaeological elements raised from the sea will be arranged in the Quaidbay fortress.

³⁵ Macedonian tombs have marble doors; here we assume that the door was made of granite or of wood.

³⁶ The Greek word lochias does not refer to "λόγχι", the spear, but to «λεχώ», «λεχούς», a woman who has given birth and has a small child to rise and protect. So the attribute of Isis Lochias refer to Isis the patroness of childhood. That attribute of Ἴσις Λοχιάς or Λοχιάδος probably derives from that used for another female Greek divinity Artemis, Ἀρτεμις Λοχία.

Ancient authors, when referring to the deaths of Cleopatra and Mark Anthony, mention also that they took place within her Mausoleum, on Acra Lochias and that this structure with its heavy door ‘which once closed could not be opened again’ was nearly ready at the time of her tragic demise. It is also stressed that Octavian gave a royal burial to his adversaries yet not in the Mausoleum which Cleopatra had constructed.

According to Dio Cassius, Cleopatra VII, during the last period of her kingship built a separate mausoleum for herself: ‘for Cleopatra had collected it all (her treasures) in her tomb which she was constructing in the royal grounds, and she threatened to burn it all up with her in case she should fail of even the slightest of *her demands*’³⁷. Plutarch, referring to the same circumstances, adds that this monument was a high and luxurious construction, adjacent to a temple of Isis: ‘and she herself, now that she had a tomb and monument build surpassingly lofty and beautiful, which she had erected near the temple of Isis, collected there the most valuable treasures’³⁸.

Among some 40 granite and quartzite blocks scattered in the shallows of this sub-site, we have located 7 blocks with Pharaonic motives and hieroglyphic inscriptions in the course of our last campaigns (**fig. 10**). A slab bears the low relief representations of the torso of a Pharaoh and on another a Pharaoh’s head is carved in low relief³⁹. Some other interesting finds are: the mutilated parts of at least two naiskos⁴⁰ type shrines (**fig. 11**), a monolithic granite block, carved with a series of five steps and the central part of a flour-mill stone and a stone grinder⁴¹. During our next campaigns⁴² we will focus our efforts on raising more inscribed blocks and making possibly casts of the inscriptions in order to understand more about the large monument to which these blocks belonged.

Chatby 2. From travelers’ relations, literary sources as well as from old maps of the 15th and the early 17th centuries, it is known that the location of our sub-site Chatby 2, was near the alleged location of the Martyrium of St. Mark⁴³ and there stood a Proto-Christian church and a Martyrium. The remains of this important building were still visible at the end of the 15th and until the early 17th centuries as indicated in the map of the Codex Urbinat⁴⁴ (**fig. 12**) and the plan of the Archivos General de Simacas⁴⁵ (**fig. 13**) although it is

³⁷ Dio Cassius, Roman History LI, 8.6, translation by Ernest Cary, Loeb Classical Library, 1917.

³⁸ Plutarch, Antony, LXXIV, 3, translation by Bernadotte Perrin, Loeb Classical Library, 1920.

³⁹ Paolo Gallo, ‘Fête-sed sous l’eau de la Méditerranée’ Proceedings, First Hellenistic Studies Workshop, Alexandria 12-18 July 2009, (Ed.), K. Savvopoulos. pp. 64-88, Alexandria 2010.

⁴⁰ Naiskos, diminutive of Naos, the Greek word for temple, a lockable shrine for storing religious images; generally made of wood or stone and placed in temples or tombs.

⁴¹ Stone grinders and millstones are often found in courtyards of Egyptian temples for the grinding of offered cereals.

⁴² Two campaigns are planned for the year 2013, during spring and autumn.

⁴³ Marurice Martin, ‘Alexandrie Chrétienne à la fin du XIIème siècle d’après Abu I-Makarim’, *Alexandrie médiévale* 1., (Ed.), by Christian Decobert and Jean-Yves Empereur, Etudes alexandrine 3, 1998, IFAO, Cairo 1998 and Jean Gascou, ‘Les églises d’Alexandrie: Question de méthode’ in the same volume.

⁴⁴ Veduta d’Alessandria, Anessa con altre al Codice Urbinat 277 della Biblioteca Vaticana ossia codice Latino di Tolemeo. Il Codice fu scritto per Ugonem Cominelli de Macerii supra Mosam in Francia Florentiae die quinta Januarii 1472 reproduced for the first time in Gaston Jondet, *Atlas Historique de la Ville et des Ports d’Alexandrie*, Société Sultanieh de Géographie d’Egypte, Cairo 1921. There is another version of this map kept in the National Library in Paris, with minor differences from the Vatican Codex. This map is also reproduced and commented on in Harry Tzalas, ‘The Two Ports of Alexandria, Plans and Maps from the

known that the church was destroyed in 1218 by the Governor of Alexandria fearing that the building could be used in case of attack against the town⁴⁶. A further testimony are the pottery sherds, all dated to the 5th and 6th centuries AD that were found in trenches dug up in the nearby beach, as well as some architectural remains located in the shallows.

Among the finds in the sea are two large capitals (**fig. 14**) datable to the 5th century AD probably part of the remains of that early Christian church dedicated to Mark the Evangelist⁴⁷. Westwards, not far from Silsileh promontory another proto-Christian find may bear testimony to that important Christian centre that was the St. Mark Martyrium. A nearly complete sigma table made of granite was found.

At **Ibrahimieh 3** there is a large reef lying at a depth of 13 - 15 m and some 450 m distant from the shore. Some 60 small and medium size stone anchors were lying around (**fig. 15**). They date to the Mediaeval Times (11th - 12th centuries AD) and were used to anchor small fishing vessels⁴⁸. A characteristic elongated opening at the top (**fig. 16**), for the lashing of the rope, led us to formulate a new theory regarding the method of anchoring: These small anchors would be dropped consecutively, one after the other, as the beads of a chaplet to secure a grip on the sea bed. The advantage of this 'anchorage à chapelet' is that while it is difficult to use a heavy anchor of say 50 or 60 kg to immobilize a small fishing craft, using three or four smaller anchors of 10 to 15 kg each is an easier process. But unexpectedly the lead components of a very large composite anchor were found on this same reef. The lead stock and the assembly collar plus the missing wooden parts must have originally weighed a total of some 600 kg and the height of that anchor was over 4 meters. This testifies to the fact that a large grain cargo of over 30 meters in length of the Graeco-Roman Times was taken adrift and had to drop anchor in a desperate attempt to avoid grounding.

It was at sub-site **Ibrahimieh 4**, that our survey started in 1998 because we were aware that within a short time the widening of the coastal road would obliterate most of the remains of a large stone quarry visible in the shallows. In the limited period of time that we had at our disposal we did whatever was possible to survey and understand these remains which coexisted with some burials. This is the largest quarry known for

14th century to the time of Mohamed Ali', *Underwater Archaeology and Coastal Management 'Focus on Alexandria' UNESCO*, Paris 2000. Also see Harry Tzalas, 'The Codex Urbinat 277 and the Plan of Simancas, Two of the Earliest Maps of Alexandria' in *Tradition and Transition, Proceedings at a Conference held in October 2007 at the Institute of Nautical Archaeology, A & M University of Texas*, in honor of George Bass and K. Van Doorninck.

⁴⁵ A map made in 1603 by an Italian spy, unknown until the 1980's, was then found in the General Archives of Simancas, Valladolid, Spain, attached to the documents E1102-36 and E1103-34. See Harry Tzalas, 'The Two Ports of Alexandria, Plans and Maps from the 14th century to the time of Mohamed Ali', *Underwater Archaeology and Coastal Management 'Focus on Alexandria' UNESCO*, Paris 2000.

⁴⁶ Maurice Martin, *supra cit.* The repeated Crusaders attacks in the Eastern Mediterranean justified the fears of an attack against Alexandria.

⁴⁷ Evaristo Breccia also notes the Martyrium of St. Mark on his *Plan d'Alexandrie à l'époque ptolémaïque avec quelques sites antiques*, made in 1922.

⁴⁸ Harry Tzalas, 'An unusually large concentration of stone anchors, East of Cape Lochias, Alexandria, Egypt. A Preliminary Evaluation', *Proceedings of the 7th Int. Symposium on Ship Construction in Antiquity, Pylos 1999, Tropis VII, Vol. II, Athens 2002*.

the extraction of stone from the shores of Alexandria and it is regrettable that after the widening of the Corniche these remains have been totally obliterated.

Notwithstanding the same widening of the Corniche road at **Sporting 5** sub-site, only 10% of the ancient remains in the shallows were affected. We started surveying what seem to be remnants of a Necropolis and more precisely the foundations of a large rectangular-shaped structure adjacent to a massive circular construction. A preliminary, basic drawing was made focusing on the endangered zone that is nearer to the shore. The deep carvings and remains of structures extend deep into the sea. There are obvious marks of quarrying activities and as with other coastal burials the Sporting Necropolis was used at an unidentified period for the extraction of stones. Two small, badly eroded calcite stone capitals have been retrieved along with a limited number of Late Roman pottery sherd.

The Tomb of Stratonice is marked by archaeologists and historians to lie exactly on that same spot on maps that go back to the end of the 19th and early 20th centuries⁴⁹.

El Hassan 6 is a reef that lies at a depth of circa 13 m under sea level and at a distance of some 500 m North East of the eastern entrance of the Eastern port. Its subsidence must be the result of a late tectonic activity. In the Codex Urbinat map of Alexandria of 1472 as well as on the plan of the Archivos General de Simancas of 1603⁵⁰ the present reef is marked as a shoal. In antiquity as well as in medieval times this treacherous shoal presented an imminent danger to navigation as it stands on the course of a ship entering the Port from the East. A limited number of dives has confirmed our assumption that several ships must have hit this deadly obstacle and sunk. A large number of amphorae, strewn on the seabed, lie on the reef and its contours. Because of its distance from Cape Silsileh the El Hassan Reef is not presently threatened by modern building activities, so it is not for the time being within our plans to carry out a complete and detailed survey of this sub-site; it will have to wait a while longer as our priorities lie with other endangered coastal areas.

Sidi Bishr 7 The Corniche from Silsileh to Sidi Bishr has been badly affected by the recent widening of the coastal road⁵¹ and all the antique remains along the coast and in the shallows have been obliterated because of the land reclaiming and the laying of concrete blocks as buttresses to the action of the waves. There is also a constant construction of coastal recreation buildings on the reclaimed land. The areas most affected are the

⁴⁹ See plan of T. Neroustos, in T. Neroustos, *L'Ancienne Alexandrie, Étude Archéologique et Topographique*, Paris, 1888 and of M. Bartocci in E. Breccia, *Alexandria Ad Aegyptum*, Bergamo 1914.

⁵⁰ See notes 44 and 45.

⁵¹ In ancient and mediaeval times there was no coastal road along the eastern suburbs of Alexandria, today's Rue d'Aboukir, the extension of the ancient Canopic way, was an inland road. The construction of the Alexandrian coastal road, the renowned Corniche leading from Silsileh to Montazah, started in the first years of the 20th century and continued until the end of the 1920's. Considered too narrow for the present traffic, works for its widening stated at the end of the 1990's and have just been completed.

suburbs of Stanley, Glymenopoulo and San Stefano. Eastwards, Sidi Bishr is the furthestmost area of our concession and was surveyed for the first time in November 2008.

To start with, the land area was surveyed and photographed by using satellite imaging as well as an old cadastral map of 1942. The geomorphology of this rocky, bare surface extending from the sea to the Corniche road can be described as follows: A triangular-shaped rough surface is all that bears evidence (above sea level) to that ancient Necropolis. It is delimited Southwards by the Corniche coastal road - which was recently widened—Eastwards by a sandy beach, artificially formed, North by the sea and Westwards by the remains of a manmade circular structure carved in the rock that, when the ceiling collapsed formed the existing cove, to which are adjacent several new, modern constructions (**fig. 17**).

The rocky surface as delineated above is marked by two large perforations which communicate with subterranean corridors, today partly submerged. 'Bir Masaoud', also called the 'Devil's' well is today fenced with a recently constructed low stone wall; it is the ventilation shaft of an ancient Necropolis. When the sea is rough, the waves reaches the fencing of the well and its spray siphons reach all around the neighboring surface. In a calm sea, the level of the water in the well is of approximately 3 m from the base of the protective low stone wall that encircles it. Divers from the Mission entered the semi submerged chamber and corridor from the sea and reached the well perforation after swimming for some 30 m. Several smaller perforations of the rock's surface have been located; some are obstructed by stones that have been dumped in them on purpose. Some others include minuscule holes, difficult to discern, which become apparent due to the siphoning of the sea water when pressure is exerted by waves coming from the North.

This entire rocky surface shows marks of erosion and well defined marks of quarrying. Most of the quarrying activities are visible by the cliff near the sea (**fig. 18**). In the sea area, as a buttress to the action of the waves and in order to protect the sandy beach that has been artificially formed eastwards of the rocky promontory surrounding 'Bir Masaoud', a quay has been built with the use of a large number of concrete blocks. This has created a sort of artificial lagoon in front of the sea entrance of Bir Masaoud and a great number of antiquities have been destroyed. Looking at the littoral from the sea one notes the abrupt cutting of the Sidi Bishr promontory. The height of the cliff formed by the quarrying process and the action of the waves has resulted in a truncated cliff of some 6 meters height above the sea water level. The depth of the water at the feet of the cliff is at some 3.5 to 4 m. That cliff has a wide, irregular orifice, part of which is submerged leading to a large chamber, a hypogeum. A corridor leads from this hypogeum to the 'Bir Masaoud well'. The ceiling of the hypogeum is cut irregularly in the shape of a vault. Between the ceiling and the surface of the water there is a height of another 3 m, while the depth of the water there is of some 3 m. The seabed in the wider areas surrounding the promontory, as well as the interior semi-submerged hypogeum are covered with numerous blocks, slabs, stones and what seems to be broken drums of columns and broken architectural elements. Because of the heavy concretion covering all these 'stones' and the very limited time of favorable weather at our disposal, they could not be identified. So it is premature to say if these hundreds of pieces are

ancient or just modern concrete debris dumped in the sea, covered by incrustation and marine growth and rounded by the action of the waves.

The weather conditions were such that the underwater hypogeum and the submerged corridor could not be even partially surveyed and it is hoped that this will be possible during our next campaigns.

East of the Sidi Bishr promontory and across the beach called Sidi Bishr No. 2 an islet now called Miami Island has been identified as Gezira Gabr El Khour which formed part of a small port installation referred to in Pirî Reis Portolan⁵² as Kürül Gûdāk. An attentive survey of this island has led to the identification of the remains of numerous ancient burials that were at an unknown period quarried for stone.

A large hypogeum tomb was excavated. It is obvious that this islet as well as the wider sea area extending north were part of the large Necropolis of Sidi Bishr (**fig. 19**). Sidi Bishr, together with the Early Ptolemaic Necropolis of Chatby⁵³ and the Necropolis of Moustapha Kamel which was in use during the whole Graeco-Roman period, and the submerged remains of Sporting represent the very last visible remnants of the extended Eastern Necropolises which extended along the eastern coastline of Alexandria. Contrary to the Necropolis of Sporting which because of its low level was totally submerged, some scant remains of the Sidi Bishr Necropolis lying at circa 6 m above the present level of the sea have been spared.

These remains have never been marked on any archaeological maps of the 19th and 20th centuries, nor are they specifically referred to in any archaeological survey. The reason being that at a time when Alexandria and its suburbs were covered with extended ancient remains, the scant ruins of Sidi Bishr were not considered worth mentioning, let alone worth surveying. Travelers and map makers of the 19th and early 20th centuries, in their references and annotation briefly refer to 'a coast covered by ruins'.

In our superficial survey at Sub-site Sporting 5 it has been suspected that at an unidentified period before being submerged the Necropolis, was used as a stone quarry⁵⁴. At Sidi Bishr as well as on the Gezira El Khour islet the quarrying is very obvious not only in the submerged parts which now lie at some 4 to 5 m depth but also on the visible remains that are high above the water level.

A methodical survey of the preserved remains which are above water level, of the subterranean corridors, now partly under the water, of the wider area which is today totally submerged as well as the relation of these ruins with two neighboring islets and reefs will be undertaken during our future campaigns.

In concluding it should be stressed that the most important of the sub-sites in the area of our concession are **Chatby 1** and **Chatby 2** where a methodical survey of the sea bottom and the raising of the ancient remains

⁵² Pirî Reis, Kitab I Bahariye, The Historical Research Foundation Centre, Istanbul 1988.

⁵³ Evaristo Breccia, Catalogue Général des Antiquités Egyptiennes (Musée d'Alexandrie), La Necropoli di Sciatbi, Cairo 1912, Vol. 1 and Ernest Sieglin, Expedition, Ausgrabungen in Alexandria, Leipzig 1908.

⁵⁴ For quarrying activities at the end of the 19th century see: T. Neroutsos, *L'Ancienne Alexandrie*, Paris 1888, pp. 2, 74 and 75.

will shed light on what once formed part of the royal quarters, near which also stood the proto-Christian site of St. Mark Martyrium. **Sporting 5** and **Sidi Bishr 7** sub-sites need to be protected from the constant dumping of concrete blocks and in that area a careful survey must be carried out in the near future. Sub-site **El Hassan 6** although of great importance, due of the presence of ancient shipwrecks, is not among our priorities as because of its great distance from the shores and the fact that it lies at depths of over 13 m it is not threatened but modern constructions. A methodical survey and excavation of that area can thus wait.

The ancient quarry at sub-site **Ibrahimieh 4** has been completely covered by the widening of the coastal road and the reef at **Ibrahimieh 3** has been adequately surveyed; their final publication should be expected before long.

We will also endeavor during our 2013 surveys to better understand the geological disturbances, the earthquakes, the tsunamis and the movements of the Alexandrian “coastal terraces” which are mostly responsible for the devastation and disappearance of the Great City.

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THE GREEK MISSION UNDERWATER SURVEYS IN ALEXANDRIA

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Captions:

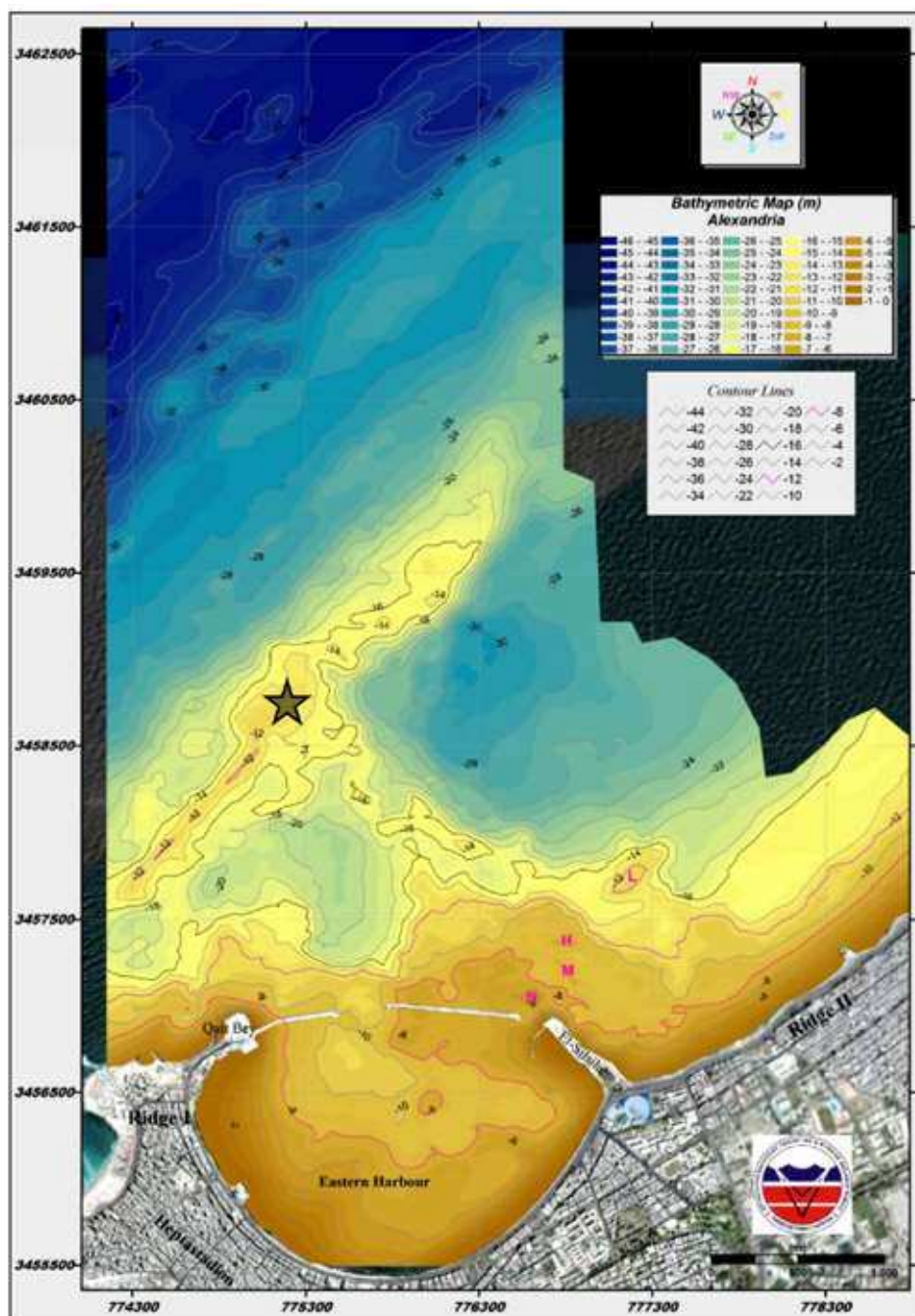
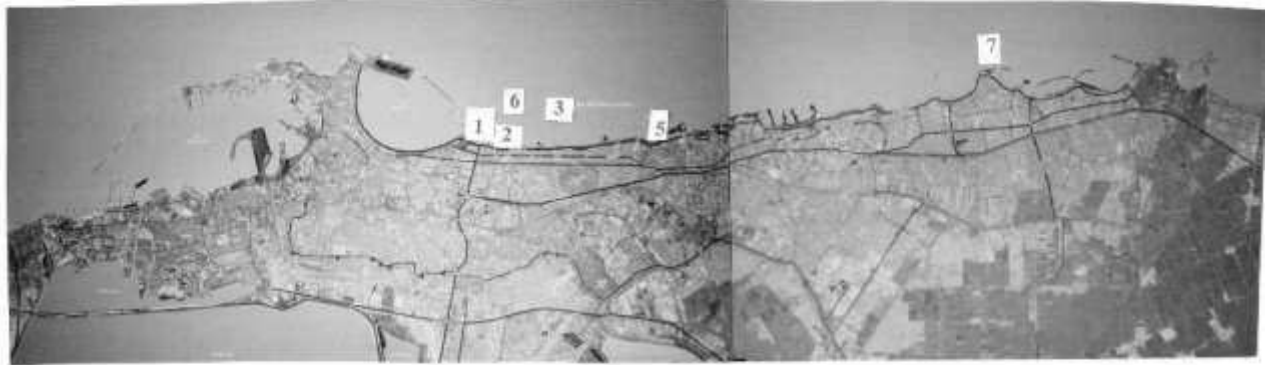


Fig. 1. Bathymetric map showing the approach of the Eastern Port of Alexandria.
 (The Laboratory of Marine Geology and Physical Oceanography, Department
 of Geology at the University of Patras)



HELLENIC INSTITUTE OF ANCIENT AND MEDIAEVAL ALEXANDRIAN STUDIES



1. Chathy 1 – Submerged Akra Lochias
2. Chathy 2 – St. Mark *Martyrium* site
3. Ibrahimieh 3 – The reef with the anchors
4. Ibrahimieh 4 – The stone quarry
5. Sporting 5 – The submerged Necropolis
6. El Hassan 6 – The reef with shipwrecks' remains
7. Sidi Bishr 7 – The Sidi Bishr Necropolis

Fig. 2. Map showing the 7 sub-sites that have been surveyed by the Greek Mission.
(Courtesy AlexMed, Bibliotheca Alexandrina).



Fig. 3. Satellite imaging of the submerged area of ancient Cape Lochias. (Courtesy
Centre d'Etudes Alexandrines).

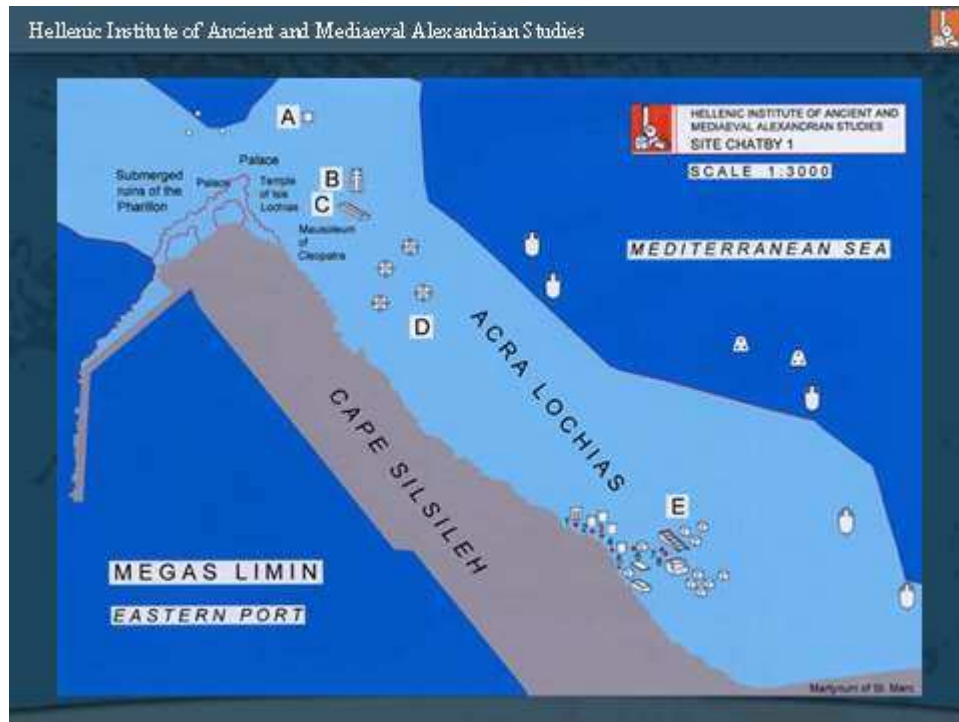


Fig. 4. Map showing the contours of nowadays submerged ancient Cape Lochias.
(The Laboratory of Marine Geology and Physical Oceanography, Department
of Geology at the University of Patras).



Fig. 5. Monumental base made of red granite.



Fig. 6. Monolithic tower of a pylon made of red granite as found on the seabed.



Fig. 7. Lifting a monolithic block of red granite, with five steps giving access to the pylon.



Fig. 8. The oversized threshold, made of red granite, of a monumental door.



Fig. 9. The pylon tower exhibited at the archaeological site of Kom el Dikka.



Fig. 10. Lifting a block made of quartzite inscribed with pharaonic motives using a floating crane of 50 tons lifting capacity.



Fig. 11. A broken "naiskos" reused in mediaeval times as a tannery basin. Note the drainage hole.



Fig. 12. The El Hassan and other shoals, which are submerged nowadays, are shown on the Codex Urbinate made in 1471.

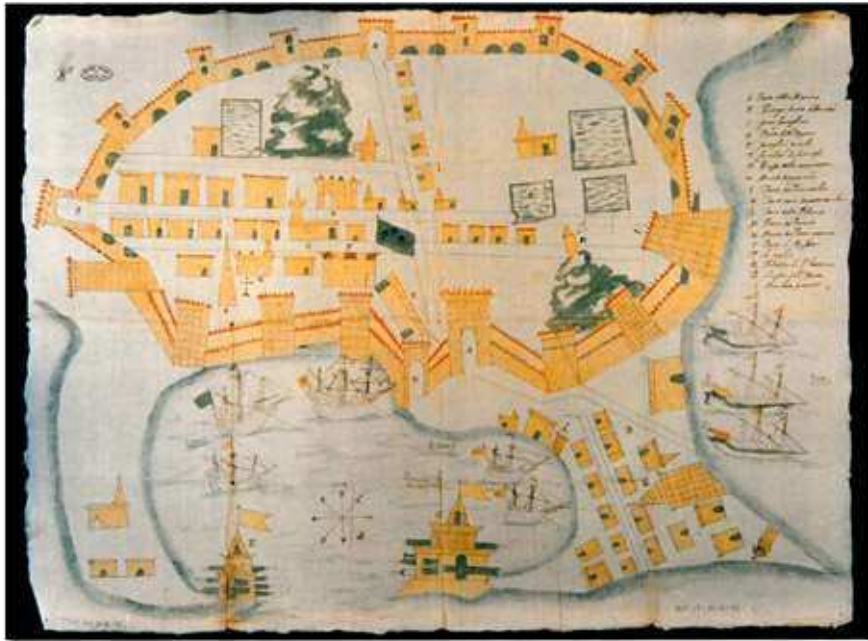


Fig. 13. The Martyrium of St. Mark is shown on the plan of Alexandria made in 1605 (Archivos General of Simancas).



Fig. 14. A large proto-Christian capital made of black granite is raised from the sea at sub-site Chatby 2.



Fig. 15. Some of the stone anchors with an elongated upper perforation found on Ibrahimieh reef (sub-site 3) photographed before conservation.



Fig. 16. A diver raising an Islamic stone anchor with an elongated upper perforation.



Fig. 17. Air photography of the area of sub-site Sidi Bishr 7 showing the ventilation shaft of a large hypogeum tomb, called "Bir Masaoud" and the small cove created after the partial collapse of the ceiling of some corridors.



Fig. 18. The entrance from the sea of the hypogeum of Sidi Bishr with obvious quarrying marks.



Fig. 19. A large corridor carved in the rock of the islet of Gezira Gabr el Khour at Sidi Bishr, is partly submerged.



Fig. 20. The members of the Greek Mission that took part in the 2011 survey.

All photographs except for figures 1, 2, 3, 4, 13 and 14 are of the Hellenic Institute of Ancient and Mediaeval Alexandrian Studies.