A PRELIMINARY SURVEY OF THE EASTERN HARBOR, ALEXANDRIA, EGYPT INCLUDING A COMPARISON OF SIDE SCAN SONAR AND REMOTE VIEWING

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Side scan sonar survey by Harold E. Edgerton - Radio Strobe Laboratory, Massachusetts Institute of Technology

ABSTRACT

This paper reports a preliminary survey of one of humanity's most historic harbors, Alexandria, Egypt. It constitutes one phase of a broader joint land/sea examination of the largest and most famous city to bear Alexander the Great's name. The research overall had two goals: 1.) To resolve locational uncertainties concerning the city's past configuration, particularly its Ptolemaic antecedents; and, 2.) to compare electronic remote sensing survey technologies with Remote Viewing generally, and the applications methodology developed by the Mobius Group, specifically. In the area of the Eastern Harbor, the aim of the research was: 1.) The location of the ancient shore line; the location and predictive description of several sites including: the island of Antirrhodus and the Emporium/Poseidium/Timonium complex; a palace complex associated with Cleopatra; and, a further elaboration, both in terms of location and predictive description, of the Pharos lighthouse area. 2.) A comparison of Remote Viewing and side scan sonar data after each approach had surveyed the same area. This paper describes the probable location of the Emporium, the Poseidium, and the Timonium, the palace complex of Cleopatra, the island of Antirrhodus, a site at the tip of Fort Sisila (known previously as Point Lochias), new discoveries pertaining to the lighthouse, and an associated temple. The most important discovery though is the identification and location of the ancient seawall which extends some 65 meters further out into the harbor than was previously suspected, and whose location resolves a key piece in the puzzle of the ancient city's layout. The discoveries reported were principally the result of Remote Viewing. Except for one clear "hit" side scan sonar proved unproductive because of the large amount of particulate in the water.

History: A more preliminary version of this report was presented as a paper at the Annual Meetings of the Society for Underwater Archaeology on 11 January 1980.

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INTRODUCTION

In 331 BCE, Alexander of Macedonia stopped at a small fishing village on Egypt's Mediterranean coast and marked out the boundaries of what would become the greatest city to bear his name. From the first its destiny was tied to the sea.[1] Its founder appreciated this and fixed its location believing, as Arrian reports, that because of the sea, "the site was the best possible for the foundation of a city and the city would prosper."[2] To achieve his ends, one of Alexander's highest priorities was the creation of what has come to be known as The Eastern Harbor.

How sound was Alexander's judgment? From its Western and Eastern harbors, Alexandria soon supplied the world with grain, with glass and with precious metals. Strabo of Amasya in Pontius, whose *Geography* describes the city three centuries after its founding provides us with an assessment from antiquity: "...the only place in all Egypt which is by nature well situated with reference both to commerce by sea, on account of the good harbors, and to commerce by land, because the river (Nile) easily conveys and brings together everything... (Alexandria) is the greatest trading center of the inhabited world."[3]

The Eastern Harbor as it appears today.

Illustration One

Fraser, writing two thousand years later offers a modern assessment that is little different: "Alexandria in the late Ptolemaic period was the unrivaled center of world trade."[4]

Today, although Alexandria is Egypt's second largest city, the Eastern Harbor is no longer a great port. Yet it remains a great intellectual asset because beneath its waters lie answers to myriad unsolved archaeological

riddles. The detritus of almost two and one half millennia of commerce has accumulated on its sea floor. Due to subsidence of the shore line, to depths as great as eight meters, a considerable number of the ancient city's most famous buildings -- structures associated with the now mythic figures of Cleopatra, Mark Antony and Caesar -- also now lie submerged.[5] What is more important, they lie relatively undisturbed, unlike the archaeological chaos to be found on the shore, where earth-moving and construction has been ongoing since 1882.[6]

Yet despite the obvious rewards to be gained from a harbor survey, a combination of technological, political and financial obstacles has, until now, forestalled such an examination.

In November 1978, the Mobius Group began planning a preliminary survey of the harbor, an area, as one looks outward towards the sea, limited on the west by a man-made peninsula known as the Heptastadium, associated since antiquity with the Lighthouse of Pharos and, on its eastern bound, by a smaller, natural although much altered peninsula known today as Fort Sisila and, previously, as Point Lochias. *(See Illustrations One and Three.)*

This harbor research constituted one segment of a broader joint land/sea examination of Alexandria. The research overall had two goals:

1.) To resolve locational uncertainties concerning the city's past configuration, particularly its Ptolemaic antecedents; and,

2.) To compare electronic remote sensing survey technologies with Remote Viewing generally, and the applications methodology developed by the Mobius Group, specifically.

In the area of the Eastern Harbor, the aim of the research was:

1.) The location of the ancient shore line; the location and predictive description of several sites including: the island of Antirrhodus and the Emporium/Poseidium/Timonium complex; a palace complex associated with Cleopatra; and, a further elaboration, both in terms of location and predictive description, of the Pharos lighthouse area.

2.) A comparison of Remote Viewing and side scan sonar data after each approach had surveyed the same area.

LITERATURE REVIEW

Strabo, who visited the city in 24 BCE, in the first decade of Roman rule, gives the best description of Alexandria and its harbors at their height. He says that while Dinocrates was the primary architect, he followed a well-tested urban plan developed by Hippodemus of Mieltus, and previously used in Priene and Herculaneum.[7] Alexander apparently admired it because it made for an urban environment with good air and traffic flow patterns, and produced a city with a sense of graciousness. Arrian tells us that Alexander himself outlined the city's walls.[8]

Ancient Alexandria was roughly rectangular in shape. Strabo calls it "an outspread chlamys" -- the cloak-like garment favored by Greek travellers and soldiers.[9] He says it was built along the sea and spread out 30 stadia (1 stade = 185m) in length (5.55km) and seven to eight in width (1.29-1.48km), with indentations on the long sides caused by the harbors on the north, and Lake Mareotis on the south.[10] The key to the city's layout was its two major streets, which intersected at right angles, and were "particularly wide, being more than a plethron (30m) in width."[11] This planned urban community must have been very beautiful, particularly along the sea frontage, which was filled with shaded groves and mansions, intermingling with public buildings. Unfortunately, almost all of this city has been lost, either beneath subsequent constructions, or because of subsidence, and so visually the city in the literature of antiquity exists today mostly in the writings themselves.

Although there is a fairly extensive modern literature on Alexandria, the scholarly writing addressing its archaeology and geography is much smaller than one would expect for a city of its prominence in the ancient world, and much of what does exist dates to before World War II. For the past 20 years, only the University of Warsaw has had an active continuous archaeological presence, and the totality of all previous marine archaeological work consists of a few dives carried out around Kait Bey in 1962 by the Egyptian Navy (which resulted in the raising of a seven meter long broken statue of a female figure),[12] and six dives in the same area, in 1968, by a joint UNESCO/English team as reported by Frost.[13] It is also worth noting that *all* of this previous underwater work stemmed not from anything in the literature but from a Customs House official and amateur scuba enthusiast, Kemal Abu al Saadat, the most knowledgeable antiquities diver in Alexandria.

Three main themes weave their way through the modern archaeological and geographical record that does exist:

1. **Cycles of habitation:** Mobius researchers were startled to discover *liv - ing* individuals who remember much of the city, particularly east of the Eastern Harbor as virtually a desert.[14] Unlike Rome the metropolis with which it is most often compared, Alexandria has not enjoyed continuous inhabitation since its beginnings, and the hallmark of Alexandrian literature is a recurring cycle of downfalls and resurgences that have occurred as a march of very different cultures have sequentially put their stamp upon the city.

The literature makes it clear that this almost constant churning has left such confusion that one of the most vexing questions has been exactly where and with what orientation the two main streets of the original city were to be found.[15] Modern authorities have achieved a rough consensus that the east-west street is approximately paralleled by the present day Sharia El Houriya (vulgarly, Rue Houriya).[16] The location of the north-south street is less clear. Fraser who has studied the question as thoroughly as anyone, concluded in 1961, that the entire issue was so muddled as to admit to no definitive answer.[17]

2. **Subsidence:** Throughout its recorded history Alexandria has been (rather more in the past than now) a geologically active area. Beginning with Strabo and coming forward in time almost every writer who has dealt with Alexandria's topography includes discussions of seismic activity and its possible effects on the undeniable and very substantial subsidence of the coast. Jondet, as in the case of most of the issues pertaining directly to the ports of Alexandria, seems the best source,[18] although Saint-Genis, the Napoleonic era Harbor Master, makes many valuable contributions in this regard.[19]

In addition to seismic activity, the reasons offered for the subsidence of Africa's Mediterranean littoral range from the weight of silt coming from the Nile mouth at nearby Rosetta, to a shift in the African plates. Subsidence is such a critical issue because the two most important centers of the pre-Islamic city, the Royal and Administrative Quarters, were to be found along the shore.[20]

Since there is not a single diving archaeologist in Alexandria, subsidence

has meant that only a few particularly prominent features of these old quarters have been described in modern times, and these only *from the sur - face.*

3. **Construction:** Beginning with the Khedival government in the mid-nineteenth century, an entirely new and almost completely artificial shoreline has been constructed, as a substantial part of the existing literature describes.[21]

For the most part though, from both the ancient and modern literature sources, as Fraser has it, "It is true we know that certain buildings, public places and so on were planned or built or recorded as having been planned or built, by certain historian figures, but the evidence is so disconnected and at times so unreliable, that no complete picture emerges…."[22]

SIDE SCAN SONAR

Harold Edgerton carrying out the side scan sonar survey
Illustration Two

In the Eastern Harbor, the side scan survey was accomplished with a Model 259 side scan sonar, and Mark 1B System Tow-Fish, both specially modified to Edgerton's specifications by the manufacturer, EG&G.[23] *(See Illustration Two.)*

REMOTE SENSING/REMOTE VIEWING

Remote Viewing and Remote Sensing are equivalent and modern terms for the demonstrated ability of individuals to describe persons, places, or events from which they are shielded by virtue of space, time, and "blindness" protocols. They do so in much the same way that an eye-witness would. All their senses report; that is they can answer questions that involve smells, sounds, colors, shapes, textures, even tastes. The mechanism of this perception is unknown. The task of the researcher is to structure the interview session in such a way that normal sensory cues are absent, and that intel-

lectual access is eliminated. The researcher in an applied Remote Sensing experiment such as this is blind to the correct information; indeed, by definition, everyone is, that is why the questions are being asked.

Although this process may seem unusual, in fact, researchers are essentially faced with a novel presentation of a familiar engineering problem: searching for a weak signal buried in noise. In the case of side scan sonar, the "noise" is particulate matter in the water, schools of fish and the like; in this instance, normal sensory awareness and prior knowledge constituted the "noise".

The laboratory research most relevant to the work reported on in this paper was that done by Puthoff and Targ,[24] at SRI, International, which has been subsequently replicated by others, most notably Schlitz and Grober.[25]

The use of Remote Sensing in archaeology enters the literature some 75 years ago with explorations of Glastonbury Cathedral in England[26] and continues (albeit infrequently) to surface periodically in research ranging from Poniatowski's in Poland,[27] Scott-Elliot in England,[28] Pluznikov in the Soviet Union,[29] Weiant's with the Smithsonian at Tres Zapotes[30] and Reid's work at Ontario Iroquois Indian sites (which used George McMullen, R3, who also participated in this Alexandrian project).[31] All of this exploration, however, was done with very little emphasis on maintaining a controlled protocol with proper blindness. Most important of all the work depended on the input from a single Remote Viewer.

In 1976, the author began developing a consensual methodology using multiple respondents independently and individually responding to the same questions -- in conditions of intellectual and sensory blindness. Each was asked the location of archaeological sites, the description of surface geography, and the description of subsurface, or underwater materials, to be found at that site. This team approach, was designed to help improve the signal-to-noise ratio previously described. The Remote Viewers functionally are the survey instruments, and using more than one on the same site is the equivalent of having multiple electronic sensors -- side scan sonar, proton precession magnetometer, as examples -- survey an area and then collectively define what is there.

The first use of this consensual methodology in underwater archaeology is to be found in the report on a 1977 experiment series utilizing the research submersible *Taurus I.* The program was conducted by the Mobius Group

in conjunction with The Institute for Marine and Coastal Studies of the University of Southern California.[32] Known as Project Deep Quest, this field project demonstrated that Remote Viewers could describe in detail, from distances of up to 4,800 kilometers, a previously unknown wreck at 92+ meters of depth.[32] In that instance Remote Viewing was successfully able to provide location as well as specifics as to what would be found, an accurate description of the site (including drawings), the cause of the ship's sinking and the approximate period the disaster occurred. All points corroborated by fieldwork, literature review, and expert analysis.[34]

COMPARISON OF ELECTRONIC REMOTE SENSING AND REMOTE VIEWING DATA

One of the research objectives of the Egyptian program was a comparison between Remote Viewing and electronic remote sensing. In addition to comparing the data, we also sought to develop a complementary approach which would use both survey techniques in order to provide researchers with the highest quality fieldwork guidance. Thus, *the "best case" scenario relying exclusively on electronic remote sensing would become the "worst case" for the combined methodology.*

MOBIUS METHODOLOGY
PHASE ONE

Mobius conducted its Remote Viewing in the following way:

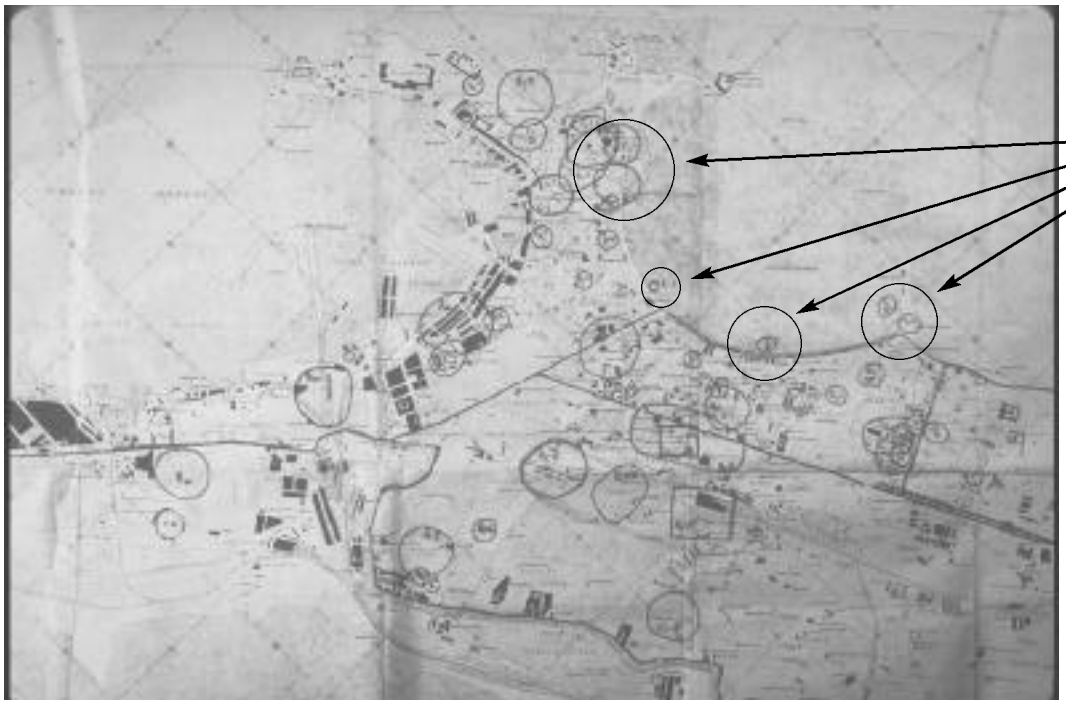
1.) A series of questions, each sealed in its own envelope, were prepared. The envelopes and a standard map -- a U.S. Army Map Service chart (1: 10,000) -- were sent to 11 Respondents. The maps had been specially prepared by having the typical multiple colors – which might provide false "cueing" – eliminated and many places names removed. This was done by producing a Mylar™ master which was then "blue printed", producing a simple line map of uniform color.

2.) The Remote Viewing team was selected and each individual Respondent was given an anonymous alpha-numeric designator, i.e.,

R1. This was done to minimize the possible impact of various conceivable researcher biases by de-personalizing the source of the data.

3.) The data gathering Remote Viewing sessions took place. Some of the interviews were conducted in person, others were conducted through the mails. Each question began with a location request, which they-were to mark on their chart, followed by a request for descriptive material concerning what would be found at the site chosen, e.g., "If you could locate a construction, ruin, or artifact associated with the famous woman in history known as Cleopatra where would you look and if you could describe what you believe is there, what would it look like?"[35] The form of the question was designed so that nothing "cued" any particular descriptive response or site selection.

4.) A composite map including all the information contained on the individual maps was then developed. Where the individual location marks from the various Respondents overlapped, Consensus Zones were cre-



The Composite Map from Probe One. Note lack of color and deletion of most place names; also Consensus Zones where individual locations overlap, and volunteered marine sites in the Eastern Harbor.

Illustration Three

ated. In the Fieldwork Phase, these zones would later be given first priority, although all marked areas would be explored. *(See Illustration Three.)*

5.) All Remote Sensing interviews, whether in-person, or via mail, were audio-taped. Once collected these tapes were transcribed.

6.) Copies of all paper work or tapes were made, and the originals were then notarized and turned over to an independent third party. (In this case all original documentation was in the hands of a bank officer and stored in the bank's vault.) This produced an unimpeachable date coded chain establishing a clear chronology of events.

7.) Working from the photocopies of the original probe responses, the Remote Viewing Research Team then analyzed the proffered Remote Viewing material seeking, in the words and drawings, patterns of commonality. These patterns were not imposed, but arose from the material itself. For instance, did more than one viewer choose the same site; did more than one of that group provide a drawing of a particular structure at that site? How similar were the descriptions? From this, and the Composite Map, a set of hypotheses was developed to guide the subsequent fieldwork.

8.) With this phase of the analysis completed, the research concurrently done by the Archives and Records Team was integrated with the Remote Viewing data. This made it possible to establish what was previously known, which proffered Remote Sensing material coincided with known information, and which was novel. Of this latter material particular importance was given to data with a low *a priori* probability. For example, if someone located a ship and described an anchor, the observation might be correct, but it would not be unexpected. If, on the other hand, they described the cargo as containing plates with particular markings, which they drew, such an observation would not be expected, and would have a low *a priori* probability.

Collectively, steps one through nine are known as a Map Probe.

9.) Since no map is detailed enough to take a location down to a level sufficient for precise excavation, two Remote Viewers went to Egypt to provide on site guidance. There each was individually taken into the city and, without access to the maps, asked to locate a particular con-

sensus zone. If that was successfully accomplished, they were asked to locate down to feet and, sometimes, inches the site within the zone. Additional information relating to artifact positioning within the site, the outline of walls and other structural aspects, subsurface or underwater conditions (silting, currents and the like) were solicited. Drawings were sought, as well as a reference to scale.

10.) All of this was taped and / or filmed on a real-time basis, the tapes were then transcribed and the transcriptions, original tapes and original drawings, as with the previous data acquired in the U.S., was notarized and sent back *prior* to fieldwork for storage control by the bank officer.

11.) From this second order of material, in photocopy form, additional analysis was undertaken. This was then folded into the first analysis and again compared with whatever had been gleaned from the ethnohistoric, geographical, and archaeological record. This analysis, when integrated with the first, produced the final guidance hypotheses under which the subsequent field work was to be conducted.

12.) Prior to the fieldwork, electronic remote-sensing of the mapped area was carried out using side scan sonar.

13.) Divers were put into the water to survey the site.

14.) Once this fieldwork was completed, a final analysis comparing predictions from both electronic and Remote Viewing surveys with actual fieldwork results was developed. It was from this that the final evaluation as to the accuracy of the Remote Sensing material was carried out.

PHASE TWO

15.) A second Map Probe utilizing nine Remote Viewer Respondents was carried out focusing (as the first Map Probe did not) specifically on the Eastern Harbor and nearby coastal waters.

16.) Analysis of the individual maps, and related descriptive material was begun prior to leaving the U.S. and completed after arrival in Egypt. A second Composite Map based on the individual maps was also compiled. *(See Illustration Seven.)*

17.) A three-week diving program was conducted by Mobius aided by Egyptian divers.

18.) A final analysis of results was conducted and this paper prepared.

PERSONNEL

To carry out this research program seven teams were assembled, each having responsibility for one aspect of the research. The speciality teams were:

1.) The Historical/Archaeological Team: Mustafa el Abbadi, historian, Chairman, Department of Classical Civilizations, Faculty of Arts, the University of Alexandria; Daoud Aboud Daoud, archaeologist, Professor of Archaeology, Department of Classical Civilizations, Faculty of Arts, the University of Alexandria, and Secretary of the Archaeological Society of Alexandria; Mohamed Hassan, archaeologist, Antiquities Inspector and Staff Archaeologist, Greco-Roman Museum; and, Mieczyslaw Rodziewicz, archaeologist, Director, The University of Warsaw Archaeological Mission in Alexandria.

2.) The Electronic Remote Sensing Team: Harold E. Edgerton, electrical engineer, Radio Strobe Laboratory, Department of Electrical Engineering and Computer Science, Massachusetts Institute of Technology; and Captain Mohamed Rashad, AREN, naval hydrographic engineer, Naval Headquarters, Alexandria.

3.) The Remote Viewing Research Team: Stephan A. Schwartz, parapsychologist, Mobius; Beverly Humphrey, parapsychologist, SRI, and Kathi Peoples, Mobius staff support.

4.) The Remote Viewer Respondents: Most viewers who participated in the first Map Probe took part in the second. They ranged in age from early thirties to mid-sixties, and came from several countries, with educational backgrounds ranging from grade school to multiple advanced degrees. When not working with Mobius, the Remote Viewers individually have successful careers in fields as diverse as aeronautical engineering, automobile repair, the fine arts, and writing.

Viewers were selected on the basis of their success in past research -- most-

ly laboratory experiments with statistical outcomes -- although the majority had participated in the Deep Quest ship location experiment.

Only one had any experience with archaeology, or even knew an archaeologist. This Respondent, George McMullen, R3, had worked for some years with Professor J. Norman Emerson of the University of Toronto's Department of Anthropology, and his student Reid.[36]

None of the viewers had ever been to Alexandria; none knew anything of its early history, although they were, of course, familiar, in the general way people are, with the historical personalities such as Caesar, Alexander the Great, Mark Antony, and Cleopatra.

All Remote Viewers were "blind" to the questions before these were presented to them, indeed, did not even know the project was to take place in Egypt. In any case, even had they been working archaeologists it would not have mattered much because the questions, for which the project sought answers, were well established mysteries over which there been much conjecture, but no resolution.

The two Respondents taken to Egypt were, McMullen,R3, and Hella Hammid,R5.

5.) The Dive Team: Commander Mohamed Khaled, AREN, a changing group of enlisted navy divers, Stephan A. Schwartz, and Kathi Peoples.

6.) The Archives and Records Team: Catherine Dees, historian; Kay Croissant, historian; Karen Winters; field log, David Keith, illustrator, and Jacqueline Kendall, staff support.

7.) The Photography Team: Glenn Winters, land-film; Bradley Boatman, land-film. Gordon Waterman, underwater - film; Dyanna Taylor, underwater - film and still photography; Karen Winters, land - still photography; and, Kathi Peoples, underwater - still photography

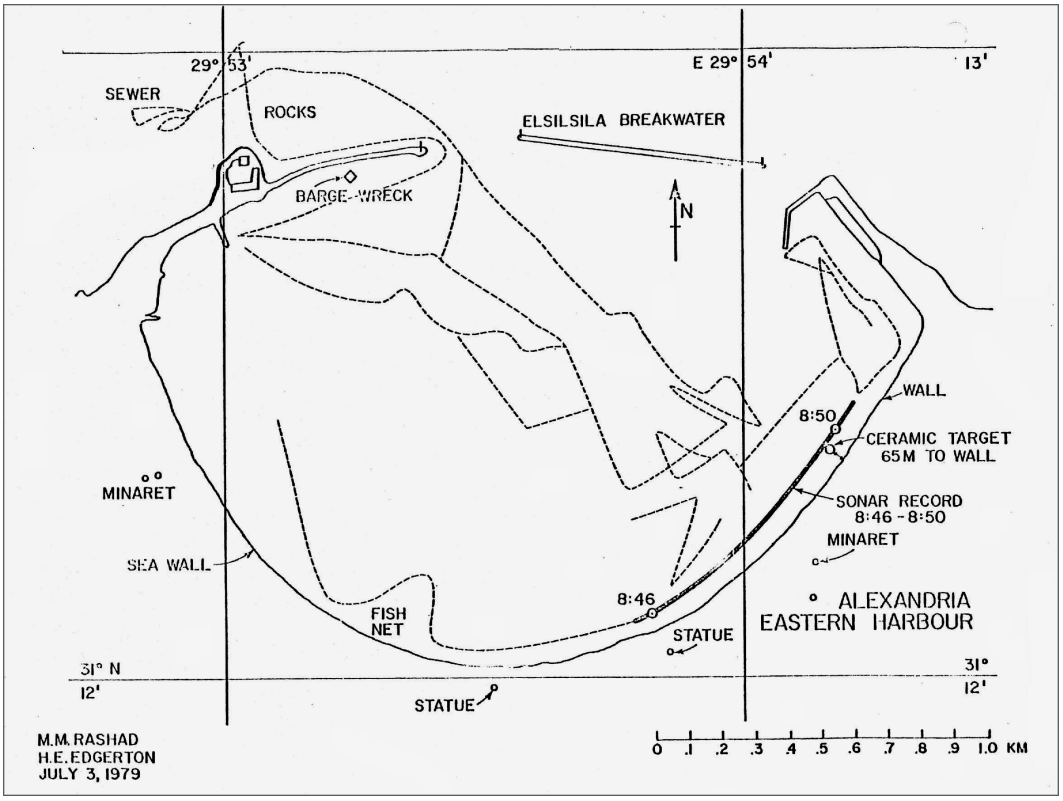
7.) The Audio Team: Sunny Meyers, audio -film; Osama Salama, audio-film; Stephan Schwartz, interviews; Beverly Humphrey, interviews.

The Photography and Audio Teams were established so that there would exist an unimpeachable real-time audio-visual record of every aspect of the experiment.

ELECTRONIC REMOTE SENSING SURVEY

Prior to conducting the side-scan sonar electronic remote sensing survey, indeed, prior to our departure from the United States, several Respondents had indicated possible sites in the waters in and around the Eastern Harbor and had marked them on their maps. *(See Illustration Three.)* Additional information was volunteered once we were on site, both before the work in the harbor was even thought possible (because of government restrictions) and, subsequently, but before Edgerton arrived in Egypt and fieldwork began.

We considered this volunteered underwater material to be particularly sig-

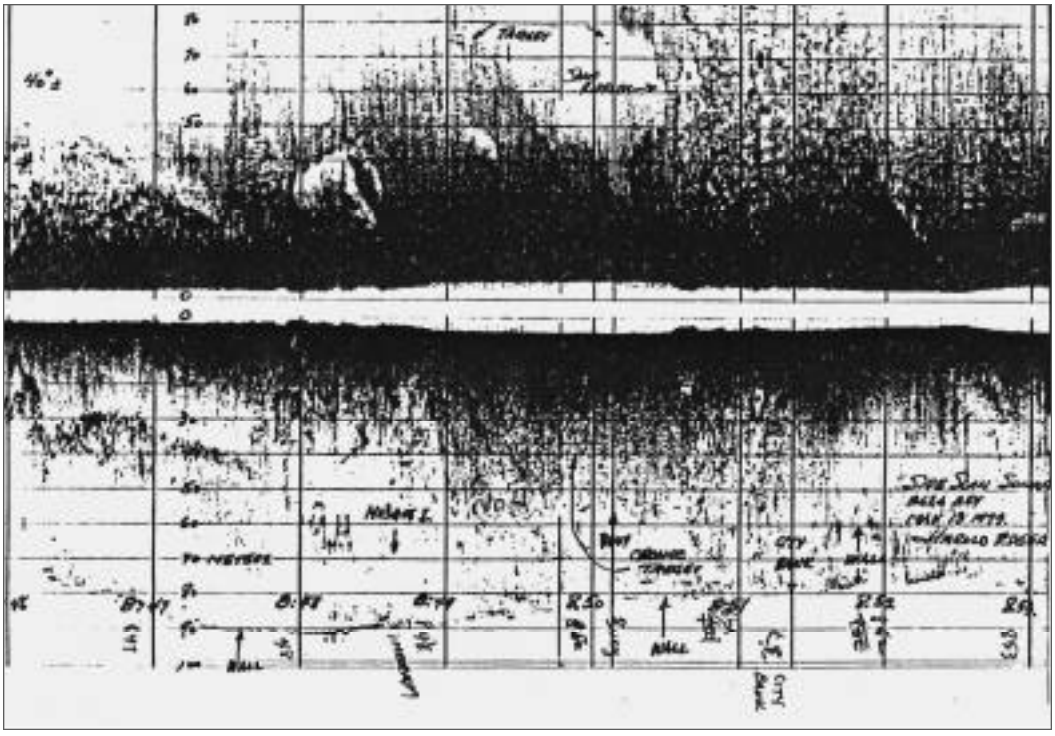


The side scan survey was done in such a way that it covered the sites selected by Remote Viewing, as well as non-RV selected areas, chosen by Edgerton, based on his best judgment, which were designed to act as controls. Nothing was discovered except in the RV-selected areas, and most RV sites produced no side scan "hits".

Illustration Four

nificant because no questions specifically directed toward underwater sites had been included in the initial Alexandrian probe. From past experience Mobius analysts were particularly sensitive to Remote Viewing data volunteered outside the scope of the questionnaire.[37] Three areas of particular interest emerged in this manner. *(See Illustration Four.)*

A side scan survey was designed to cover all the volunteered Remote Viewing sites as well as non-RV selected areas, chosen by Edgerton, based on his best judgment, which were to act as controls. This work began on the 8th of May 1979 and continued for the next four days, hampred almost continuously by the extreme amount of particulate matter suspended in the water. The results were disappointing, as Edgerton's very short report makes clear:

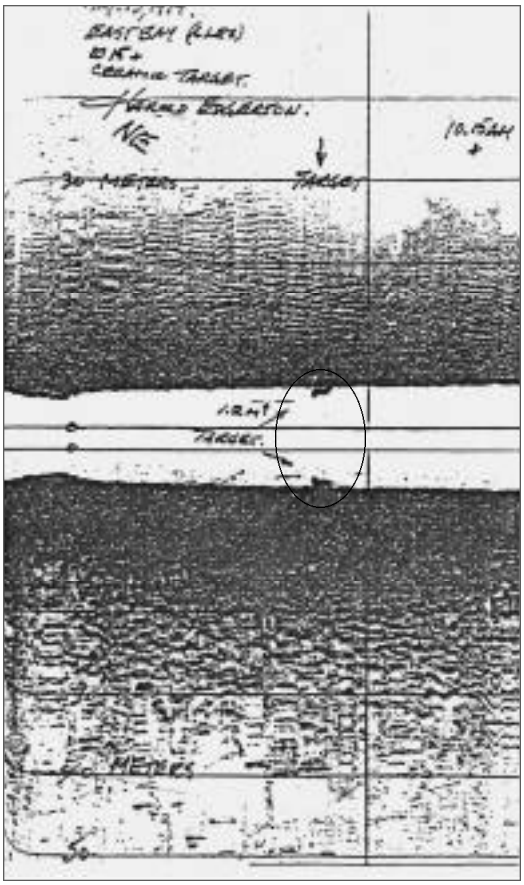


Side scan sonar track from 8:46 to 8:50a.m. on the morning of 13 May 1979, showing "ceramic" target at site Remote Viewers felt would mark ancient sea wall. It is approximately 65 meters from existing corniche wall and suggests that the the Greco-Roman city has subsided far more than was previously appreciated.

Illustration Five

"This report covers the use of an EG&G side-scan sonar at the Eastern Harbor of Alexandria as requested by Stephan Schwartz, Research Director of the Mobius Group, Los Angeles, California. I left Boston on May 1, 1979 taking with me an EG&G type 259 side-scan sonar which is especially useful for the underwater search areas where artifacts protrude from the sea's bottom.

A map of the Eastern Harbor of Alexandria *(See Illustration Four)* with dotted lines indicates some of the survey paths where navigation was made by Mohamed Rashad of the Egyptian Hydrographic Service. He used two sextants that read on-shore points. One sonar trace, taken on May 13 from 8:46 a.m. to 8:50 a.m., corresponds with the course shown on the above chart of Eastern Harbor. *(See Illustration Five.)* Attention is directed to the location of the "ceramic" target which is 65 meters from the present sea wall, on the east side of the harbor.



Side scan trace showing "ceramic" target.

Illustration Six

A second trace *(See Illustration Six)* from the side-scan record shows a vertical view of the same "ceramic" target since the course of the survey ship went directly over the target. I measured the height above the sea bottom of this target to be 1.2 meters."

PHASE ONE FIELDWORK

During the side scan survey, we made several initial dives on sites identified by side scan or Remote Viewing.

A note of caution about the precision of our locations: It proved very difficult to shoot a transit on a diver or a buoy from the shore, so some variance, measured in a few meters, must be understood. For ease of comparison between the various data sources, the sites covered by the first phase of fieldwork are presented with the following structure:

1.) Literature Review
2.) Side Scan Sonar
3.) Remote Viewing
4.) Field Observations
5.) Summary

CENTRAL HARBOR

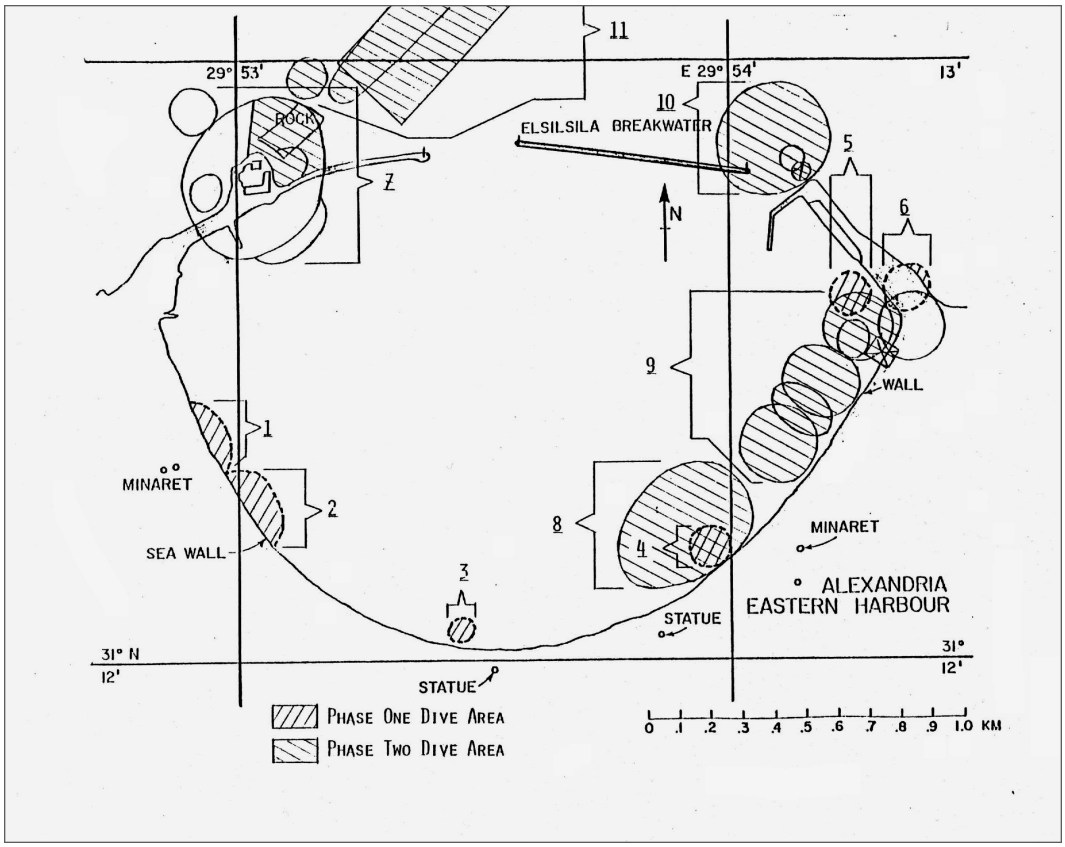
SITE 8 - THE 8:46 SITE

1.) **Literature Review:** A massive pillar was discovered at this site, and we began a search for some mention of such a large column in the classical literature sources, but found nothing that could be directly correlated. Henry H. Gorringe, a former naval officer hired to bring back one of the Cleopatra obelisks to New York does make a reference to what we think is the same column, although it adds little and is so vague about exact location as to be useless for that purpose: "…about one hundred yards from the beach (a measurement made from somewhere on the shore prior to construction of the present cornice -- *SAS*) there is a broken column sticking up from the bottom of the sea, nearly equal in diameter to Pompey's pillar."[38]

2.) **Side Scan:** The "8:46" site was described by Edgerton and nicely outlined on the trace -- demonstrating that the side scan not only tested as operating correctly, but demonstrated that it was functioning properly. *(See Illustration six.)*

3.) **Remote Viewing:** No data sought or volunteered.

4.) **Field Observations:** 8:46 proved to be a large Aswan granite column lying on its side. The dimensions of the column (about 4 meters long by 2.5 meters in diameter. No other pillar even approaching its dimensions was found in the vicinity. One diver reported that he could feel a base to the pillar, and the trace suggests this, not the column may have been what



The dive chart was derived from both the first and second probe Composite Maps. Each circle was originally drawn by an individual Remote Viewer. The sites were first surveyed using Side scan sonar and, then, explored by divers during one or both phases of fieldwork.

Illustration Seven

the sonar registered, but we could not see it since it lay beneath a thick layer of sand and broken shells.

Nearby, perhaps nine to 10m away, and unrelated to the sonar hit, evidence of what we now believe is the ancient seawall was discovered. The diver said it seemed "almost like ceramic"and that the fragment ran parallel to the corniche.[39] Diving the next day resolved this odd description: the discovery was not, in fact, ceramic, but rather brick and stone "welded" by time and overlaid by marine growth.

5.) **Summary:** This site was the one clear side scan "hit," although there is confusion as to whether it was the base or the column that triggered the sonar trace. The Archaeological / Historical Team felt the column must be commemorative rather than structural, particularly since nothing else

remotely like it was found at the site. We think this is the same column described by Gorringe, and the fact that it is no longer visible from the surface provides some measure of the change in the quality of the harbor water over the last hundred years. Beyond the find itself, the placement of the column was significant, because it supported the location of the ancient seawall as being much further out to sea than was previously thought. As for what we now believe to be a seawall fragment: at the time this small section was not enough left to reach any conclusion.

CENTRAL HARBOR
SITE 8

1.) **Literature Review:** Since this site figures prominently in the next phase of fieldwork, the description and the corresponding correlations with various literature sources will be presented below.

2.) **Side Scan:** Site Surveyed. No contact data.

3.) **Remote Viewing:** Respondent R11 selected this site by Remote Viewing from his home in Los Angeles, as he answered the first Map Probe questionnaire. The Respondent provided no specifics relating to the site or its contents except that, "it was an important site".[40]

4.) **Field Observations:** The floor of the harbor was literally strewn with columns and bases, all of Aswan red granite, and all of which were clearly *in situ*, since the columns all point in one direction and many had fallen so as to break into obviously associated fragments. The site itself was on a slight rise or mole, although silt deposition over the centuries had reduced the differential between this area and the surrounding sea floor.

5.) **Summary:** Site 8 *(See Illustration Seven),* was the most visually interesting of the sites located in the harbor proper during Phase One. From the very first dive in this area it was clear that this was a major site. Even at this early stage, both Daod and Abbadi (who were present in the dive boat when the divers surfaced and reported) felt that the type and configuration of the ruins corresponded closely with Mark Antony's Timonium.[41]

CENTRAL HARBOR
SITE 4

1.) **Literature Review:** Nothing specific to the site.

2.) **Side Scan:** Surveyed, no contact data.

3.) **Remote Viewing:** Volunteered site. Remote Viewing data from R3 while at his Canadian home during the first Map Probe. Site associated with the ancient seawall, which R3 felt extended considerably further out into the sea than is presently the case. *(See Illustration Seven, Site 4.)*

4.) **Field Observations:** Divers found what seemed to be another section of the seawall. The discovery of this site, also approximately 65 meters from the present corniche, seemed to provide further support for the conclusion that we had, indeed, located the ancient seawall.

5.) **Summary:** The decision was made to re-explore this site in Phase Two.

FORT SILSILA/POINT LOCHIAS
SITES 5

1.) **Literature Review:** Strabo describes: "Lochias with a royal palace upon it."[42] Such word pictures seem clear at a distance but, when one considers them on-site, one realizes the words are subject to more than one interpretation. Even Fraser seems to get confused when describing the area around Lochias. The problem is further complicated because the eastern peninsula of the harbor which Strabo saw was a very different geographic configuration than the one that Saint Genis saw in the 18th century, or that Mahmoud Bey saw in the 19th [43], and that quite different than the one we see today.

2.) **Side Scan:** Site surveyed. No contact data.

3.) **Remote Viewing:** Volunteered Site. Respondent R11 selected Site 5 along Fort Silsila's western flank. General description of important buildings. *(See Illustration Seven, site 5)*

4.) **Field Observations:** The present day Lochias is a relatively uniform low lying finger of land that has obviously been altered by man and is now virtually concreted over by military installations. In times past it was both much wider and more irregular than it is today.[44] There has also been considerable subsidence of the land, which only complicates an already confusing picture. Because of the security regulations only two dives, one with one diver the other, the next day, with two divers, were permitted slightly inside the security perimeter in and around Site 5. The first diver reported a 300 sq. meter floor of blocks or mosaic approximately 20 centimeters square. A buoy was dropped to facilitate location the next day but when we made our second dive, we encountered what was to prove a continuing source of frustration. Although the buoy was in place, the currents in the bay had shifted and the site was now covered with sediment. Divers reaching down through approximately 20 centimeters of sand could feel the blocks beneath their fingers.

5.) **Summary:** Security regulations prohibit foreigners from approaching to within closer than 300 meters from the peninsular shoreline.[45] We decided to pursue a waiver of the restriction for the next phase since unbidden Remote Viewing had indicated a site within the restricted area, and diver exploration had discovered the floor.

WESTERN SIDE OF HARBOR

SITES 1 AND 2

1.) **Literature Re-view:** Nothing specific to site.

2.) **Side Scan:** Area not surveyed.

3.) **Remote Viewing:** The sites were selected but little specific descriptive material was provided.

4.) **Field Observations:** Two divers checked this site, but it proved too dangerous to examine closely. This is the part of the harbor where pleasure and fishing boats are moored, and the boatmen who move their boats in and out of here were unfamiliar with diving, and did not appear to recognize the divers' flag. During the short dives we saw what seemed to be remnants of some construction, and we brought up some broken amphorae.

The Kait Bey Fort as seen from the seaward side. The Pharos site discoveries are clustered around the base of this promontory. Note modern breakwater blocks.

Illustration Eight

5.) **Summary:** This site should not be attempted until some way of protecting the divers from boat props can be set-up.

KAIT BEY - PHAROS
SITE 7

1.) **Literature Review:** *(See Phase Two.)* The Frost report, a copy of which we finally located in Alexandria the day before this site was surveyed describes a number of structural antiquities in this area, such as statues,[46] much of which matched the Remote Viewing data and made this site a high priority

2. **Side Scan:** Site surveyed. Because of the large stone blocks used in the breakwater construction it was impossible for the sonar survey to differentiate any possible antiquities from the modern breakwater installation. *(See Illustration Eight.)*

3.) **Remote Viewing:** Two months before coming to Egypt, George McMullen, R3, voluntarily provided considerable information concerning the lighthouse, drawing it as it may have appeared during several periods of its history.[47] During late March of 1979, when Mobius was concentrating on the land phase of its work in Alexandria, McMullen began again to volunteer information about the lighthouse.

After the first quick exploratory dive, an on site session was conducted with McMullen on 12 May 1979. This produced both a detailed drawing of the lighthouse, and the observation that the building was constructed of "red granite". [48] Of particular interest was his description of "round stone things,"[49] which could not be directly correlated with any objects described in ancient sources, nor anything seen on the single dive. This is a good example of a Remote Viewing observation with a low *a priori* prob-

ability. Additional volunteered Remote Viewing in the first Map Probe also prompted us to search an area approximately 20 meters away.

4.) **Field Observations:** Only one 20 minute dive, by one diver, was possible due to sea state and permission issues. On the western side of Kait Bey, the diver reported what seemed likely to be a sewer outlet and, on the eastern side of Kait Bey, what appeared to be building remnants. At the site 20 meters out to sea, a wall remnant was found.

5.) **Summary:** Even this cursory survey made it obvious that this site would be a high priority for Phase Two. The Remote Viewing data also suggested there was much to be discovered.

The wall remnant we did discover may be the channel and dam mentioned by Jondet.[50]

CONCLUSION

With the exception of the 8:46 Site, where the commemorative pillar was found, the side-scan sonar phase of our survey was generally disappointing. It was equally evident that Remote Viewing proved to be a very efficient search technology. In the absence of side scan contact data, sites that could have taken days or even weeks to find using grid search techniques, were found in minutes. Regardless of how sites were located, it was immediately obvious to everyone that the Eastern Harbor held a promise of archaeologically significant finds more than equal to our most auspicious expectations.

PHASE TWO FIELDWORK

The success of the initial phase of fieldwork led us to conduct a second Map Probe using the protocol already described. Questionnaires and a new chart were sent out on 17 October 1979 to nine Respondents. This probe was specifically focused on underwater sites. The charts and questionnaires were all returned on or before 23 October 1979. It was immediately evident that the results were unusually consensual, and overlapped sites from the first Map Probe. *(See Illustration Seven.)* After analysis, three main areas: Sites 7, 4/8, and 5/9 comprised our first priority. Two additional areas, Sites 10 and 11, *(See Illustration Seven)* were targeted for exam-

ination as a second order of priority. Sites 1,2,and 6 made up a third tier of work.

PHAROS
SITE 7

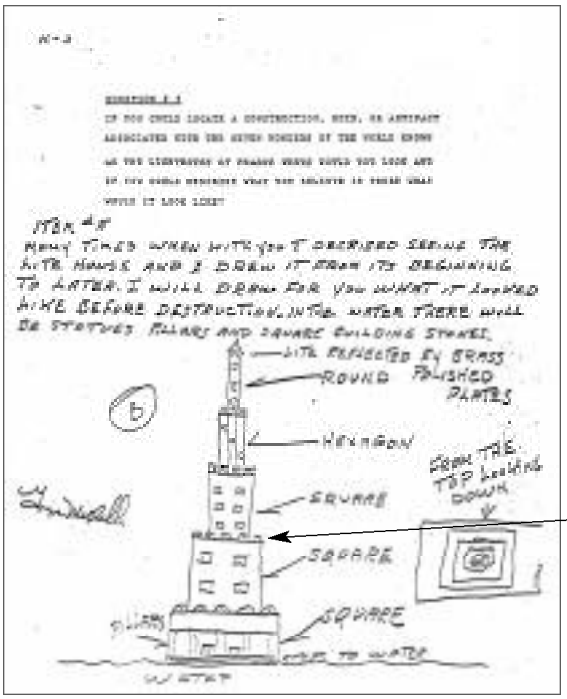
1.) **Literature Review:** Strabo describes the Lighthouse as "…at the extremity of the isle which is a rock washed all around by the sea and has upon it a tower that is admirably constructed of *Leucos lithos*" -- which has sometimes been translated to mean "white marble."[51] This sounds rather simple but it is not. To begin with the area now known as Kait Bey was, in fact, originally two islands,[52] with a double arch connecting them that allowed ships to pass between the harbors.[53] (No clear picture of what this looked like survives.)

Some authorities feel the lighthouse may have been built not where the Medieval Kait Bey Fort is now located, but upon a small islet, known as Diamond Rock, which now appears to be unrelated to the main mass at the end of the Heptastadium, although as Jondet and Saint Genis argue, it may once have been connected as part of a larger plateau, sections of which have now sunk.[54] Fraser, however, argues against Diamond Rock being the lighthouse site.[55]

Further confusing the issue is the question of what Strabo meant by *Leucos lithos.* We feel marble would not have been the material chosen during the time of Ptolemy Philadelphus (circa 280 BCE), when the bulk of the lighthouse's construction was carried out.[56] Marble is vulnerable to the sea air's corrosive effects and, even more compellingly, there is no proximate source. Historically marble was sufficiently scarce and expensive that Alexandrian statues often had just their faces carved from it, so it is hard to imagine even the wealthy Ptolemies underwriting the cost of the tons of marble required to even sheath so large a structure.[57]

Frost presents an alternative hypothesis with which we subscribe: the building may have been covered by white or light colored plaster.[58] This is certainly within the known parameters of Ptolemaic architecture.[59] The idea also finds an historical basis in a story told by Lucian, in which Sostratus (who may or may not have been the architect of the

lighthouse)[60] wrote a dedication using his own name and then plastered it over, painting on this new surface a second dedication to the king. As the years progressed this superficial plaster covering wore away (one must admire Sostratus' acute sense of timing, revealing, safely after his monarch's death, the dedication to Sostratus which lay beneath.[61]



Note the stone "beads"

A copy of an actual question form from the Second Probe, showing drawing of the Lighthouse of Pharos. Note the round "beads" ornamenting the first level, which were discussed in on site sessions, as well as particulars of building materials to be found, and the reference to the brass mirror.

Illustration Nine

It is significant that throughout the six dives made by Frost, she "..saw no white marble though we did find black marble in the sea."[62] As proved to be the case with our own diving experiences, this initial 1968 UNESCO sponsored English effort found Aswan granite to be the principle ancient construction material remaining at this underwater site, and this accords well with the granite construction materials found at land sites.[63]

The literature suggests that much of the lighthouse fell into the sea beginning in 956 CE when 15 cubits (≈ 6.4 - 8.5m) toppled from the top of the lighthouse.[64] An earthquake in 1303 appears to have done even worse damage as mentioned in Ibn Battuta's 1326 report.[65] In 1349, when Ibn Battuta visited again, he found the structure in so ruinous a condition that it was impossible to enter or climb up to the doorway.[66] Shortly thereafter, it appears to have disappeared entirely from the Alexandrian skyline, since eyewitness accounts of the ruins are no longer found.

2.) **Side-Scan:** Site surveyed. No useful contacts.

3.) **Remote Viewing:** The second Map Probe produced a wealth of new material including McMullen's (R3) more complex drawing of Pharos *(See Illustration Nine).*[67] Additionally, the Remote Viewers outlined what seemed to be both temple and lighthouse remains, specifically describing "statues, pillars, *heads*, and square building stones".[68] Notably absent in all of the proffered Remote Sensing data was any description – in contradiction to what was expected – of the kind of massive remains one would associate with a building generally considered to be one of the tallest in the ancient world, possibly as much as 122 meters in height.[69] This is another example of a low *a priori* probability observation.

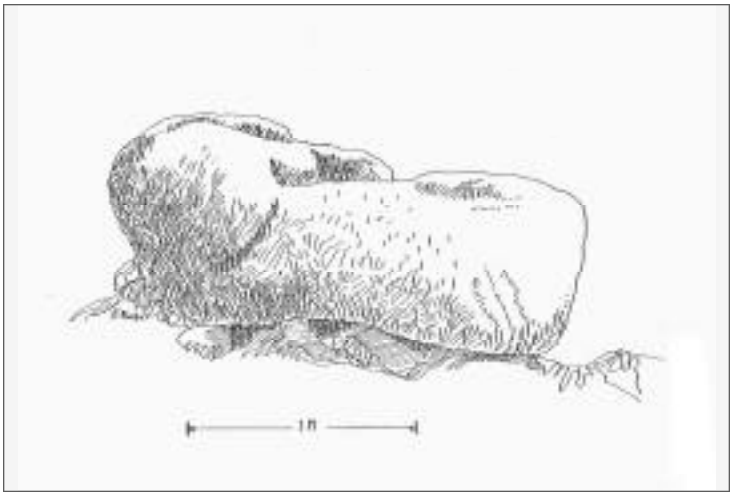
4.) **Field Observations:** Approximately 43 hours of diving time was allocated to the Pharos area during the second phase, with as many as six divers in the water at the same time. The average depth varies between seven and 10 meters. Orienting ourselves on Kait Bey we directed our search out from the breakwater in a "pie wedge" pattern, filling in each wedge before moving to the next one. We also directed similar search patterns diverging from finds made by the Frost/UNESCO program. These dives were conducted during October and November, the months generally considered by local divers to be the best "diving window" for these waters.[70] The water was certainly clearer than it had been during the early summer months, but at no time would one have considered conditions ideal, because a voluminous amount of raw sewage outfall comes from a sewer pipe just to the west of Kait Bey.

Diving is best carried out prior to 1100 because the bottom current usually flows west from Kait Bey until then, when it reverses and returns the sewage to the east where the antiquities are clustered. The sewage then became so dense it could be smelled through one's mask underwater. *No diver, even when the sewers are not operating, should attempt exploration of this area without a full spectrum of protective injections to the maximum dose for bodyweight.* [71]

Further complicating the picture, while we were diving large cement blocks (≈2.5m x 2.5m) were brought around by barge and dropped in the antiquities zone to either extend or buildup the breakwater. The effect of this construction on antiquities was devastating.

This harbor work did result in one positive effect though. After the

blocks were dropped, a heavy storm took place in Alexandria over the next two days, making diving impossible. When we returned to the site we discovered that the cement blocks had caused a shift in the bottom currents. Over two meters of silt, composed mostly of sand and broken shells had shifted, effectively lowering the bottom level. Happily, this revealed a host of previously undetected ancient structural remnants.



This sphinx , found in a location identified by Remote Viewing, was found lying headless on its right side.

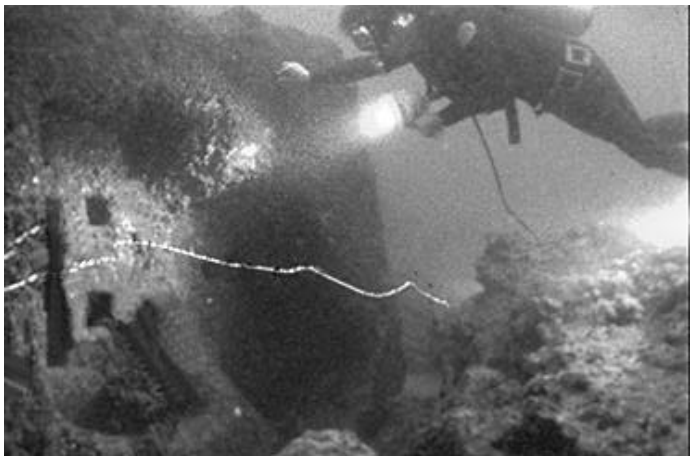
Illustration Ten

In general, the most interesting area was a sort of pocket zone coming around from Kait Bey, looking east, beginning approximately 12 meters out from shore and extending from the fort around to the Kait Bey breakwater. Here, in spite of turbidity so bad that visibility was reduced to a meter or less, and underwater photography was intermittently compromised, we found what were clearly the remains of a major structure. The floor of the sea was almost carpeted with columns, plinths, pediments, blocks (one meter or more square) andother structures. At almost a bisection of the angle created by the Kait Bey fort and the breakwater, a sphinx was found. The sphinx was oriented on its right side and had no head. *(See Illustration Ten.)* It was approximately 2.1 meter long, down the back and 1.25 meters high, with a thickness of just under one meter. Kemal Abu al Saadat, who was diving with us, agreed that this was not one of the sphinxes reported by the Frost group.

Slightly further out and about 20 meters to the east, a very large rectangular block was located *(See Illustration Eleven.)* This block appears to have been previously undetected. Saadat, the local diver, had never

seen it. It was about 3.60 meters long, 2.70 meters wide and 3.60 meters thick. Across what was almost certainly its top are incised a variety of small and large cuts, notches and recesses (some of which are inside of each other), all of which are obviously man worked.

Rodziewicz, when he was shown pictures of this block, provided a possible explanation. He felt that some of the smaller recesses, which were located inside the larger ones, had probably been cut to allow wooden wedges to be inserted to facilitate jamming a lifting ring in place. This allowed the block to be moved. The larger irregular recess was evidently designed to contain the base of a statue.[72] Since this recess was over two meters in length it gives some idea of the impressive monolithic nature of the statue. Two other similar large blocks, both reported by Frost, were rediscovered in this area.[73] Both exhibited similar sockets.



The massive scale makes it clear that the Lighthouse and the surrounding area, must have been every bit as impressive as ancient eyewitnesses suggest. Note notches in base block.

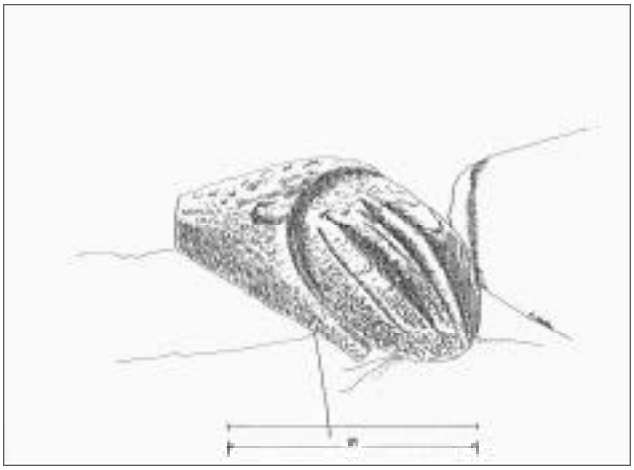
Illustration Eleven

A portion of the Isis Statue found lying on its side.

Illustration Twelve

A 4.7 meter long Isis statue also reported by Frost,[74] was refound. It had what clearly appeared to be a kind of lengthwise rectangular protrusion, possibly used to fasten it to a "female" equivalent in a wall, thus supporting Rodziewicz' explanation. *(See Illustration Twelve.)*

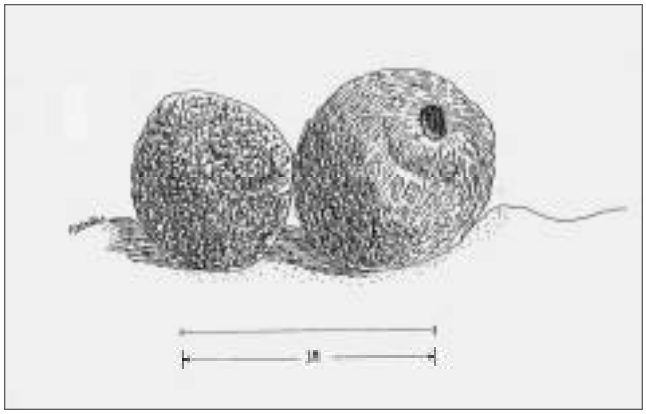
We did not find the Crown of Isis Hathor which Frost reported,[75] and we suspect that the hide-and-seek nature of the shifting seafloor accounted for its disappearance. Another crown, however, was located. This one rested about 12 meters offshore, closely proximate to an enormous pile of columns. It was 1.8 meters long with Alexandria's trademark blend of hellenistic and pharonic design elements. *(See Illustration Thirteen.)* The crown was deemed to be masculine by the Historical / Archaeological Team. They felt it was probably associated with Osiris, particularly in light of its proximity to Isis.



Ossirian Crown shows a typical Alexandrian blend of Hellenistic and Pharonic motifs.

Illustration Thirteen

Close to the crown we located several clusters of the unusual stone "beads" predicted and described by R3 before the first phase of diving had begun. They apparently were exposed when the seafloor dropped, since we had not seen either them or the crown on earlier dives. *(See Illustration Fourteen.)* The beads were uniformly about 2.6 meters in circumference and, just as in R3's drawing, had holes approximately 20 centimeters across and between 15 and 20 centimeters in depth.



These large stone beads were predicted by Remote Viewing. They were clustered in groups, but their exact number, like their exact usage, was impossible to determine.

Illustration Fourteen

5.) **Summary:** Although there was an impressive amount of structural material at this site, there was not enough to account for a building the size of the lighthouse which confirmed what the Remote Viewing data had predicted. It is possible that much, indeed, conceivably most, of the building did not fall into the sea but was hauled away for use in the construction of other buildings, possibly including the original Kait Bey Fort, and this would explain its absence. Remote Viewing provided an observation about this which we were unable to follow up on, but that we think deserves future consideration: During the course of an on site Remote Sensing session with Respondent R3, he stated that much of the lighthouse material had been reused in the construction of the large mosque near where the fishing fleet is currently moored.

Remote Viewing descriptions of granite -- rather than marble -- also were confirmed. All the objects we found were formed from Aswan granite, except for the sphinx, the crown and several columns which were of either a gray granite or of syenite. One diver reported a white marble column, but on subsequent dives this could not be relocated.

Fieldwork seemed to confirm another Remote Viewing observation: since much of the material we found was seemingly religious in nature the Remote Sensing descriptions concerning a temple that was proximate to the light house seem very reasonable. The sense of the archaeologists was that it was probably associated with Isis Pharia.

The fact that the majority of these remains are clustered in one area, and are evidently *in situ*, would also seem to argue that the temple site did not fall over into the sea but rather that the land upon which it was situated subsided.

Only further exploration and study will definitively resolve the issue of the missing lighthouse material and allow us to separate what are specifically temple ruins from lighthouse remains.

The absence of statues which might correspond with the bases that both Mobius and the Frost groups discovered could possibly be attributed to deterioration of marble in the sea, although the Historical/Archaeological Team felt that something should have remained. Perhaps the statues were removed, possibly even destroyed, during one of the numerous civil confrontations which plague so much of Alexandria's history.

We did not resolve another lighthouse mystery: for centuries there has been a controversy over how the light from the lighthouse was focused -- by a lens or a mirror? We can add little except to note that R3 described it as a "polished brass mirror arrangement." *(See Illustration Nine.)* This seems to us more logical than the lens hypotheses and, although we searched for both, nothing was found. A mirror or lens could, of course, still be beneath the sands. However, we feel – particularly if it was a mirror -- that it is far more likely such a valuable mass of metal would have been taken away for re-casting.

No one to whom we showed drawings of McMullen's "beads" was able to shed any light as to what they were. Nothing argues against the Remote Viewing data, which suggested they were a decorative element lining the top of one of lighthouse's staged terraces. Indeed, this seems the most probable explanation.

Based on our fieldwork, it seems probable that Fraser is correct, and that Diamond Rock was not the site of the lighthouse. We searched around Diamond Rock and found nothing which could possibly be identified as lighthouse remains.

Two final points deserve mention here: It is clear is that this was another instance where the "noise" overwhelmed the signal in the side scan survey. Also that Remote Viewing provided accurate locations and site reconstruction data that contradicted the common wisdom.

TIMONIUM/POSEIDIUM/EMPORIUM
SITE 8

1.) **Literature Review:** Strabo says, "Above the artificial harbor lies the theatre; then the Poseidium -- an elbow, as it were, projecting from the Emporium, as it is called, and containing a temple of Poseidon. To this elbow of land Antony added a mole projecting still farther, into the middle of a harbor, and on the extremity of it built a royal lodge which he called the Timonium."[76] The site of the Timonium has always exerted a special fascination, since it was here that Antony reputedly fell on his sword; and it was from here that, still living, he was taken to Cleopatra.[77] But the question of the Timonium's exact location has remained unsettled.

Mahmoud Bey placed it on his map of the city, along with an accompanying description putting it about 650 meters from the site he described as the location of the Royal Harbor, on the west flank of Lochias.[78] Further, he states that it projected about 200 meters from the coast, with an additional 300 meters of masonry construction projecting beyond that.[79] Hogarth, commenting on Saint Genis' description, felt that what appears to be the remains of quays are probably "..merely the lowest courses of large walls…"[80] One difficulty is that even in antiquity the city underwent a period of partial desertion in this area. Ammianus Marcellinus indicated that as early as 273CE much of the core area, including the sites of many buildings near the palaces had been abandoned.[81] Approximately 100 years later another writer, Epiphanius called the area a "desert."[82]

2.) **Side-Scan:** Site surveyed. No contact data.

3.) **Remote Viewing:** Respondent R11 picked a site which he associated with Antony during the First Map Probe, before we left for Alexandria. The Second Probe, which focused on the harbor produced several overlays on this initial location. Respondent R4 actually used the word Timonium, saying: "There should be parts of columns of the Timonium and one small area at its tip reached by a small hole, this was Antony's small place of his own."[83] Respondent R9 described "a small amphitheater, very small, only room for about 20 people."[84] Respondent R1 picked the same area, but felt drawn to it initially because he believed that "there were also steps to a small building where Cleopatra walked."[85] In analyzing this data, it seemed to us that more than one site was involved, and that this must, collectively, have been an active center during the time of the Ptolemaic city.

4.) **Field Observations:** As already noted, this site had produced substantial finds during our first dives in the late spring of 1979, and became one of our primary targets for diving during the second phase. In all, some 30 man-hours were spent diving on this site during the second phase of fieldwork.

Within the harbor, as at Kait Bey, diving is best done in the early morning. A current develops between 1100 and 1130, at which time the already turbid water becomes so heavily laden with particulate matter that it seems one is swimming in minestrone soup. Visibility by 1300 was often reduced to less than a meter. Luckily, there is nowhere near

the same amount of sewage as at Pharos, although patches still come in, as well as oil slicks from fishing boats and the usual floating detritus of most modern city harbors anywhere in the world. Strangely though, there is very little litter on the seafloor, found between 6.5 and 8 meters in depth. The bottom is mostly sand and broken shells with some marine growth extending up from the floor.

At the site selected by the Remote Viewers, we found what appeared to be a small peninsula, however we did not find it going out so far as Mahmoud Bey described. There seemed to be a tapering off at about 80+ meters out. Also, as previously noted, the differential between the seafloor proper, and the level of the now underwater peninsula is probably not as great as it once was. Today it averages (acknowledging that this could shift by a meter or more depending on the weather and sea currents) about one meter.

The first thing that strikes the diver's eye is the large number of broken columns. Although many were in several sections, they are clearly *in situ* -- probably breaking as they fell -- because they all point in a common direction, slightly eastward off perpendicular to the present shoreline. All were of the usual red Aswan granite and, collectively, they gave the impression of making up the long side of a building. Not only are they obviously associated but they are of uniform diameter, about one meter. There is also one fairly large (about 15 meter on a side average) "patch" of pottery. Numerous samples of pottery were discovered. Rodziewicz and Daoud made an initial evaluation that they were comprised of a mix of Roman and Hellenistic.[86] Their association with the site, of course, is strictly problematic at this stage.

Several bases without columns were discovered, as well as a number of capitals which were approximately one meter across. Unfortunately, the capitals were so corroded that no details could be ascertained except they appeared to be carved.

At the northern edge of this Site 8, there was a rise. Because we had spent so much time exploring closer in, and because diving was possible only a few hours each day, we were not able to explore this in the detail we would have liked. Two divers swimming over the area both reported that the rise may extend for some distance.

The issue of whether we were seeing the ancient seawall or quays was

also settled through the subsequent location of a quay running perpendicular to the wall fragments we began discovering in Phase One. Additional portions of this seawall were discovered to the east of Site 4.

5.) **Summary:** In light of these discoveries, we believe the ancient shoreline, lined with a brick seawall, ran approximately 65 to 75 meters seaward of the present corniche; the variation probably accounted for by the fact that the ancient harbor was not so regular in appearance as the present day's uniformity.

This site is obviously a series of major constructions. For all that, we found nothing that specifically seemed to us to be the small theater mentioned by the Respondents, but the fact that it was described and is known to exist is provocative. We also did not discover Mahmoud Bey's 300 meters of masonry, but it could well be there just under the sand.

This area is clearly worthy of a much more complete examination using equipment we did not have.

WESTERN SIDE OF HARBOR INCLUDING BASE OF FORT SILSILA/POINT LOCHIAS

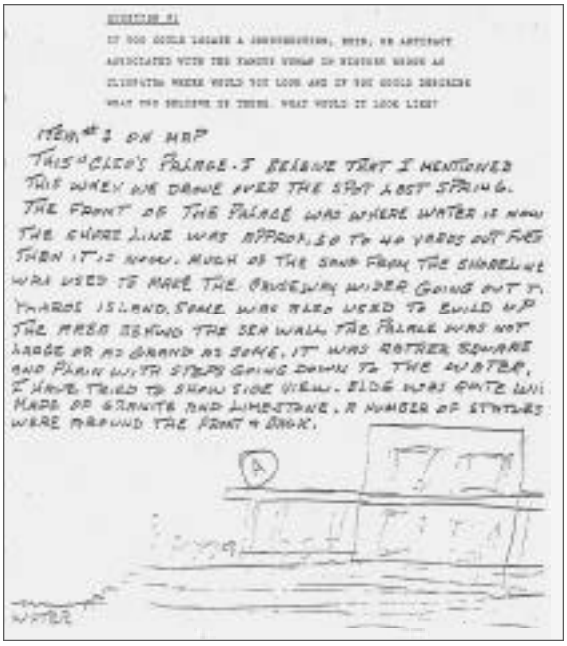
SITES 5 & 9

1.) **Literature Review:** Strabo says, "...one comes on the left to the inner royal palaces, which are continuous with those on Lochias and have groves and numerous lodges painted in various colors."[87] *(Also See Phase One.)*

2.) **Side-Scan Sonar:** Site surveyed. No contact data.

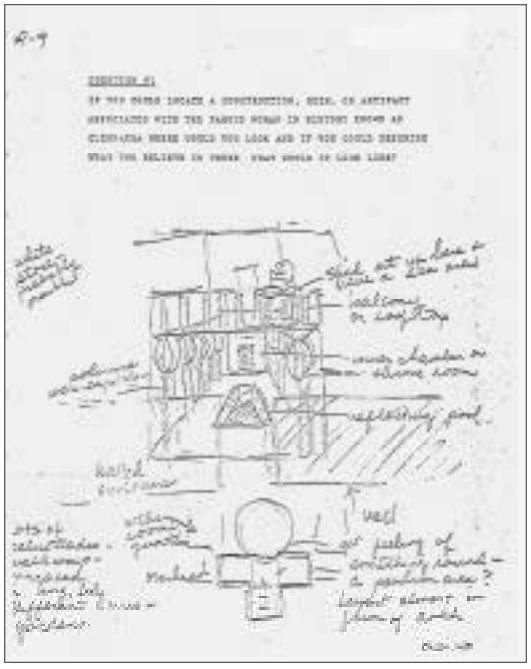
3.) **Remote Viewing:** Respondent R3 marked this area, and initiated his response with the flat statement that a palace associated with Cleopatra had once stood at this site.[88] He also stated that it was at the base of Lochias where Alexander had first sketched out his plans to build the city.[89] Respondent R4, in the second Map Probe voluntarily traced out

what she felt had been the ancient shoreline and stated also that palaces had been at the base while the Royal Harbor was nearby in the harbor.[90] There she also described a palace associated with Cleopatra VII[th] (the only Cleopatra history remembers): "Cleopatra's palace overlooked the Royal Harbor."[91] Exactly where she meant the Royal Harbor to be was not clear. A Palace was also described by R9 as having been in this area and both she and R3 drew pictures



Similar descriptions independently provided by several Remote Viewers, such as this one describing "Cleopatra's Palace," are considered particularly significant

Illustration Fifteen



Note absence of the Pharonic motifs, which are evoked when most people think of Egypt.

Illustration Sixteen

which have many similarities *(See Illustrations Fifteen and Sixteen.)* Since we had already dived on this area when it was first selected back in the spring of 1979, it was with particular interest that we returned for a second examination.

4.) **Field Observations:** All *caveats* about diving conditions for the Timonium / Poseidium apply here as well. There are substantial construction remains in this area but they lie mostly beneath the silt, where they can be felt but not seen. All that could be seen, at least while we were diving, were a

few columns and one base similar to the ones found at the Timonium/Poseidium site; the measurements and description are the same. We also found a low rise about 40 meters out from a line obtained by bisecting the angle created where Lochias joins the shoreline. This rise has a kind of amoebic shape and appears to have constructions under the silt within part of the rise. The rise is perhaps 30 meters across at its widest point, although this was hard to estimate with any accuracy because of the silt, the very substantial weed growth on the seafloor, and the very poor visibility.

5.) **Summary:** Although this site was visual unrewarding the fact that material was found, and that so many Respondents, who had been so accurate on so many other issues, picked this one area, leads us to believe that a much more extensive examination should be made. Strabo's description further urges this, since this may well be part of the Royal Complex he describes as the home of the Ptolemies including, presumably, the legendary Cleopatra VIIth.

In our view the rise we found is the other candidate site for the island of Antirrhodus which lay outside the Royal Harbor. The confusion arising from our attempt to reconcile what Strabo said with what we discovered in the harbor.

TIP OF LOCHIAS

SITE 10

1.) **Literature Review:** There appear to be no definitive references to this area, other then Strabo's statement that there was a palace on the tip of Lochias.[92] This is possibly the palace to which Antony was taken after falling on his sword, the place of the final scene between him and Cleopatra. However, since the peninsula is so grossly changed, one can hardly say where the tip Strabo saw falls in relation to what is present today.

2.) **Side Scan:** No survey of this area was made.

3.) **Remote Viewing:** Two Respondents, R3 and R4, each picked a very small and almost exactly overlapping area at the end of the peninsula. Despite the paucity of classical and modern literature source material,

Modern Lochias is so massively altered from its past configuration, that the outlines of the ancient peninsula will be hard to ascertain without significant fieldwork. Note modern breakwater blocks.

Illustration Seventeen

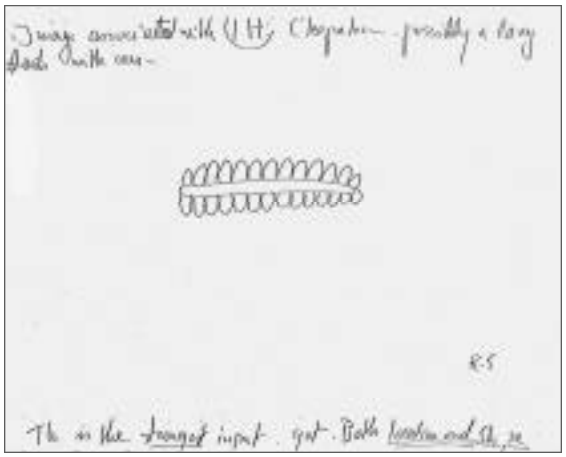
and the fact that no side-scan sonar was even attempted -- the water being too rough -- the location was so specific we decided to dive on this site. Viewers R3 and R4 both felt the area had something to do with Cleopatra, although they were not in agreement as to the association describing it variously as a "tomb" or a "statue" that Cleopatra had built.

4.) **Field Observations:** Our usual recommendations about diving safety obtain, because there is a sewer with an output equal to that of Pharos outlet at the eastern base of Lochias whose outfall sweeps around the point.*(See Illustration Seventeen.)* The average water depth was about 8 meters and the water clarity, when the sewage was not present, was probably the best in the harbor area. The seafloor was also quite clean, with little weed growth and no litter at all. Only one dive, of about 45 minutes was made here by three divers.

In exactly the area marked by R3 and R4, four large rectangular blocks were located. They appeared to be *in situ* and were of a size that made it unlikely that they could have been moved. They are not modern. However, because of their angle -- they were in a rough line at about a 45 degree angle pointing westward from Lochias' tip -- it is possible, although not probable, that they were antiquities dumped here at some later date to form a breakwater. The blocks were all of Aswan granite, and uniform in size and shape; about 3.6 meters long by 1.5 meters wide and 1.65 meters thick. A uniform lip sticking out approximately 10cm and about 10cm thick went all the way around one end. They

reminded one of the platform bases for large statues seen at the Pharos site, but there were no recesses such as were found there. One of the four was broken and we sought to determine whether they were hollow. However, the break, about a meter in from the end, was positioned in such a manner that this could not be determined.

5.) **Summary:** We could not evaluate the importance of this site, only note that it was located based entirely on Remote Viewing.



One of two "boat" drawings and descriptions which, along with location, came from Remote Viewing sessions.

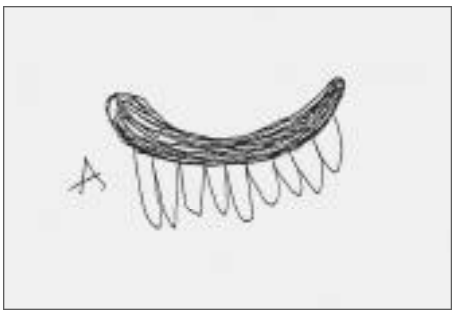
Illustration Eighteen

OPEN SEA - NORTH OF KAIT BEY
SITE 11

1.) **Literature Review:** Nothing specific to the site.

2.) **Side-Scan Sonar:** No survey of this area.

3.) **Remote Viewing:** Four Respondents chose this area. Two felt that the site was the location of a sunken boat *(See Illustration Eighteen for R5's drawing and comments).*[92] They each drew virtually the same drawing in describing the boat. *(see Illustration Nineteen for R3's drawing.)* R3 felt there should also be a statue(s).[94] R8 felt the site was related to the ancient lighthouse.[95]



A second viewer, blind to the first, pro - vided essentially the same location, description, and drawing. The repetitive pattern could be oars or amphorae -- which were found on site.

Illustration Nineteen

4.) **Field Observation:** The morning of the dive the Egyptian diver Saadat, who had been told nothing of the Remote Viewing perceptions, when asked about the site, said that in 1961, he had been diving at this site and had found a boat with two statues aboard as cargo. He had been back to the

Amphorae found at a site located by Remote Viewing, and described as being associated with a shipwreck.
Illustration Twenty

spot several times, but because of the shifting sands, he had never been able to find either the boat or the statues again. Saadat and another diver went over the area in detail. They found several amphorae, *(See Illustration Twenty.)* and some suggestive raised areas but, because of the silt, nothing could be identified.

5.) **Summary:** Although not terribly productive during our dives, Saadat's earlier experience, which vouchsafes the Remote Sensing data, plus the Respondent observations, suggests that this site is well worth further exploration.

EAST SIDE OF LOCHIAS

SITE 6

1.) **Literature Review:** The same material cited for Site 5 may be relevant.

2.) **Side scan:** No survey

3.) **Remote Viewing:** This appears to be a subsidence site associated with what had once been a palace or administrative structure.

4.) **Field Observations:** Ruins are visible nearby from the surface on clear sea days. Modern construction has seriously disrupted everything at this site. Two divers, reported that what seemed to be constructions which could not be seen, but which could be felt beneath the silt.

5.) **Summary:** Unless sites like this are explored in the near future, it is likely it will never happen. As at the tip of Lochias, and around Kait Bey, modern harborworks are rapidly precluding future study.

DISCUSSION

Although this paper presents only a preliminary survey of a complex area, we propose that several independent, yet associated, conclusions can be sustained.

1.) **Archaeology:** First, the locations and reconstructions we made, when added to what was already in the literature, make it clear that the Eastern Harbor and environs are a neglected locale for underwater archaeological examination, and one which holds enormous promise. Except for the bothersome output from the sewers, the diving is technically simple, there is no area requiring decompression allowance, and the rewards are great. We view it as a tragedy that so little has been done in this area, although we recognize that until recently political conditions did not permit foreign divers access to these waters. However, now under the new governor, Dr. Hilmy, who is himself a scholar -- he was a professor in the field of Urban Planning at the University of Alexandria for many years -- there exists a climate of scholarly inquiry. The Department of Antiquities has also recently demonstrated some interest in the exploration of the harbor.

The work at the sites located, has only begun and, obviously, there is a great deal to discover. It is our hope that the entire Eastern Harbor area can be declared a protected underwater archaeological park, and a sustained multi-year program similar to that being carried out by the University of Warsaw at Kom El Dikka funded and begun.

The fieldwork also calls into question some ancient sources, notably Strabo. The complexity of the finds at what we have designated Site 8, suggest that his description of the Eastern Harbor in 24 BCE may be skewed. The things he says were there seem to be there, but not quite where he places them.

2.) **Comparison of Electronic and Remote Sensing:** It is obvious that Remote Viewing was more productive than side scan as a search approach, in this setting. Normally it would have taken weeks or even months doing search patterns using a side scan, and magnetometer to effect these locations, if they were made at all. Instead there was no search. We went to the locations indicated, dived there, and made the discoveries. With Remote Viewing guidance it never took more than a few minutes to locate the site. There are many benefits: a.) It is cheaper to search in this man-

ner. b.) Even if electronic remote sensing is used, its employment can be much more focused (if Remote Viewing fails one can always fall back on standard electronic search protocols). c.) In underwater archaeology, where time is always an issue, it is more efficient to use Remote Sensing. d.) The "worst" case scenario using Remote Viewing, is the "best" case scenario to be obtained using electronic sensing alone. This does not mean we are arguing for the abandonment of electronic sensing, quite the contrary. Our view is that these two approaches are best employed together in both a complementary and comparative manner.

3.) **Remote Viewing Accuracy:** It is not clear that the various types of Remote Viewing data should all be given equal weight, and this is the most pressing problem facing this technology. The location data worked very well. The descriptive material was also impressively accurate. The Stone "beads", with their small holes, are a good example. The part that is not clear yet is whether the analytical material, i.e., this site was associated with Mark Antony, will prove to be equally correct. Our initial conclusion is that it will not. Remote Viewing has not proven very useful for analysis or subjective judgments, i.e., how many times does a person have to be in a building to be associated with it? But we lack the relevant information to be clear about this. Only further experimentation will answer the question.

4.) **Issues of Blindness:** A problem whose answer was known neither by researcher nor remote Viewer, but which was known by some one or some literature source, would be double-blind; a question whose answer was totally unknown, to be revealed only through fieldwork, would be considered triple-blind. The Eastern Harbor experiment included sites where varying degrees of blindness obtained. Certain locations, most notably the Lighthouse of Pharos were known in at least a general sense. Others, such as the site on the flank of Fort Silsila / Point Lochias were not.

The Respondents probably did not have access to the rare or obscure books or manuscripts which contain the information cited in the Literature Review sections of this paper, and did not know they were going to be asked about these subjects, until they were. But the possibility exists that some general knowledge or just good luck could account for some of the Remote Viewer's success.

It is also true that even where the general location was known there were were still opportunities for triple-blind work in the location and descrip-

tion of previous unknown material within the site. The experiment as a whole illustrates how applied Remote Viewing experiments differ from laboratory research. In an appplied experiment, success ultimately turns on whether the site being sought is found or not, and whether the reconstructive material is accurate. This is in contrast to laboratory research where evaluations of accuracy ultimately are statistical.

5.) **Final Evaluation:** We believe the most conservatively accurate assessment of this survey project would be that the literature review was more useful than side scan sonar data, and Remote Viewing -- particularly in locational terms -- was more valuable than either. The mechanism of Remote Viewing may not be well understood but, operationally, using this methodology, clearly produced significant original and supplementary locational guidance as well as providing accurate predictive reconstructive information, all confirmed by diving fieldwork and expert evaluation. As hypothesized, the use of all three information sources working in concert produced the most optimal results.

ACKNOWLEDGEMENTS

We wish to acknowledge and thank The Honorable Dr. Mohamed Fouad Hilmy, Governor of Alexandria, under whose personal auspices this research was carried out, for his many kindnesses. We thank also Dr. Youseff Garianhi, Director of the Greco-Roman Museum, and his staff, for their assistance in the literary research which went into this paper. Our thanks also goes to Rear Admiral Aly, AREN, Commander of Egyptian Naval Forces in Alexandria, for making it possible for the commando dive team in his command to work with us. Captain Mosehn El-Gohary, AREN (Ret.), and Captain Shafik Wahden, AREN (Ret.), principals of Red Sea Divers Service, we wish to thank for their almost miraculous ability to locate equipment we needed. Finally, and most particularly, we thank John and Pamela Leuthold, Mrs. Margaret Pereria, Trammell Crow and Gordon McLendon without whose generous financial support the project could not have been undertaken.

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[2] *Ibid,* p. 467

[3] Strabo. *The Geography of Strabo.* Trans. Horace Leonard Jones. (Harvard Univ. Press: Cambridge and Heinemann: London, MCMXLIX). Vol. VIII, p. 53 (Strabo, 17.I.13).

[4] P.(eter) M. Fraser. *Ptolemaic Alexandria.* (Oxford: Oxford, 1972), Vol. I, pp. 133-188.

Fraser's three volume work, is unquestionably the finest overall modern source, although there is no formal bibliography as such. References are included in the copious notes, often in abbreviations which maybe cryptic to those not thoroughly familiar with the source literature on Alexandria. One can do no better in seeking to understand trade during the Ptolemaic period, and to a slight extent later, than review Fraser's Vol. I, chapt 4.

[5] Reports of underwater ruins abound, but perhaps the best are those contained in *Description de L'Egypte,* which was prepared by researchers accompanying Napoleon during his incursions into Egypt. These men wrote with a standard of observation which at least anticipates the modern day, and they had the benefit of seeing Alexandria before the Khedival and later constructions began. In *Description de L'Egypte,* see especially Saint-Genis in *Antiquities,* vol. II (1818), chapt XXVI, pp. 1-95, particularly *Section Premiere, Partie Maritime*, pp. 12-14; also *appendices,* pp. 1-12, also Gratien le Pere in *Etat Moderne,* vol. II, 2 *parties,* pp. 262-324.

[6] Alexandria's shoreline has actually been in a state of man-made flux since the city's founding – the causeway (Heptastadium to Pharos Island being an example. But the late 19th Century saw the major changes. In the 20th Century the shoreline itself – if not the structures on it – has ben relatively stable.

[7] Fauzi Fakharani. "The Tomb of Alexander the Great." Unpublished paper. University of Alexandria, 1974.

[8] Arrian. *Loc Cit.* i, ii.

[9] Strabo. Vol. VIII, p. 33.

[10] *Ibid.*

[11] *Ibid.*

[12] We were never able to locate any written record of this work, although Frost references its occurence, and several of our consultants remember it taking place, although not exactly what happened; it apparently was very informal.

[13] Honor Frost. "The Pharos Site, Alexandria, Egypt." *The International Journal of Nautical Archaeology and Underwater Exploration.* Vol.. 4, Mar. and Sep., 1975, pp. 126-129. Although very limited in scope, Frost's work was the only prior modern survey report of the Eastern Harbor we were able to discover.

[14] Eight Egyptian citizens who had lived most or all of their lives along the sea front were interviewed; their median age was 63. They reported that within their lifetime, to the east of Lochias, and particularly beyond the Chatby area, the city had been largely vacant. Governor Hilmy reports that, "Alexandria for several decades has had a chronic over-population problem which has fueled an extremely active building program. Much that was vacant, and even the former gardens of villas has had to be built upon." (Governor Hilmy. Private Communications, May 1979.)

[15] Fraser. Vol. I, pp. 13-14.

[16] *Ibid*, and *cf* 31.

[17] *Ibid.*

[18] G. Jondet. See *Les Ports Submerged de l'Ancienne Ile de Pharos.* Monograph 29 (Mem. Inst. Eg: Cairo, 1916); also Monograph 2 (Mem. Soc. Sultan de Georg.: Cairo, 1921).

[19] Saint-Genis. *Description de L'Egypte.* Vol. II, chptr., XXVI, pp. 1-95.

[20] *Ibid.*

[21] The construction of this shoreline has caused enormous problems in establishing any stratigraphic context on finds near the shore. See Fraser, vol. II, p. 13, note 31.

[22] Fraser. Vol. I, p. 36.
[23] Harold Edgerton, Private Communication, 8 May 1979.
[24] H.(arold) E. Puthoff, Russell Targ. "Information Transmission Under Conditions of Sensory Shielding," *Nature.* Vol. CCLII, Nov. 1974, pp. 602-607. Also "A Perceptual Channel for Information Transfer Over Kilometer Distances: Historical Perspective and Recent Research. *Proceedings of the Institute for Electrical and Electronic Engineering.* Vol. LXIV. March 1976, no. 3., pp. 349-354.
[25] Marilyn Schlitz and Elmer Grober. "Transcontinetal Remote Viewing." Unpublished Paper, Institute for parapsychology and Institut fur Grenzegebiete der Psychologie under Psychohygiene, N.D.
[26] Schwartz. *Secret Vaults.* pp. 1-56. Also pp. 353-354 for bibliography.
[27] *Ibid.* pp. 57-107. Also pp. 354-355 for biblography.
[28] *Ibid.* pp. 108-127. Also pp. 355-356 for bibliography.
[29] *Ibid.* pp. 127-135. Also 355-356 for bibliography.
[30] *Ibid.* pp. 222-238. Also Clarence W. Weiant. *An Introduction to the Ceramics of Tres Zapotes, Veracruz, Mexico.* Bulletin 139. (Smithsonian, Bureau of American Ethnology: Washington, 1943) and "Parapsychology and Anthropology." *Manas,* vol. 13, no. 15 (1960).
[31] Schwartz. *Secret Vaults.* pp. 211-221. Also "Psychometrics and Settlement Patterns: Field Tests on Two Iroquoian Sites." Unpublished paper, n.d.
[32] Stephan A. Schwartz. *Project Deep Quest, a Prototype Experiment in the Application of Intuitively Derived Data in Marine Archaeology*. Mobius Report No. 4. Originally an invited address. The American Society for Psychical Research. January 1979.
[33] *Ibid.*
[34] *Ibid.*
[35] Question #1, Probe II, 17 Oct 1979.
[36] Norman Emerson, Department Anthropology, University of Toronto, interview 14 November 1974. Emerson began reporting on his work using Remote Viewing in 1974 and continued until his death. (See Norman Emerson. "Psychic Archaeology," *Psychic.* Sep / Oct 1975, pp 23-25. See also Stephan A. Schwartz, *The Secret Vaults of Time,* (Grosset & Dunlap, New York, 1978), pp. 356-357 for a complete biblography of Emerson's reported work.
[37] Although we find no research specifically designed to evaluate the accuracy of volunteered vs. elicited data, numerous researchers mentioned the subjective conclusion that "volunteered response material which the sensitive himself feels is worthy of mention, seems often to be more accurate than subject areas pre-determined by the researcher."
[38] Henry H. Gorringe. *Egyptian Obelisks.* (The Author: New York, 1882)
[39] Diver report. 13 May 1979.
[40] Remote Viewing Transcript, Respondent R11, 16 Feb 1979.
[41] Interview with Mostafa el Abbadi, Department of Archaeology, University of Alexandria, and Daoud Abou Daoud, Department of Archaeology, University of Alexandria, and Secretary of the Alexandria Society for Archaeology, on site, 14 May 1979.
[42] Strabo. Vol. VIII, p. 39.
[43] Mamoud-Bey ("El Falaki"). *Memoire sur L'Ancienne Alexandrie.* (N.P.: Copenhagen, 1872). Mahmoud Bey, known casually as "El Faliki" (the Engineer), was actually an astronomer in the Khedival government. Although he is a very controversial figure, his mid 19th Century excavation work was one of the first systematic archaeological explo-

rations of Alexandria – done at a time when much that was ancient still remained relatively *in situ*.

[44] Fraser, Vol. 1, p. 23

[45] *Memorandum on Security Regulations Relating to Fort Silsila.* Navy of the Arab Republic of Egypt, Mohamed Aly, Commander Naval Forces of Alexandria, N.D. It is perhaps worth noting that Egyptian security personnel accompanied us at all times during our survey of the Eastern Harbor.

[46] Frost. *Loc Cit*.

[47] Remote Viewing Transcript, Respondent R3, 12 May 1979

[48] *Ibid.* and drawing.

[49] At the time this paper was prepared, the identification of these stone "beads" still remained a mystery.

[50] Jondet. *Les Ports.* pp. 48-50.

[51] Strabo. Vol. VIII, p. 25.

[52] *Frost. Loc Cit.* p. 27

[53] *Ibid.*

[54] Saint-Genis. *Loc Cit.* pp. 17-29.

[55] Fraser. Vol. II, p 44, *cf* 98.

[56] Saint-Genis. *Loc Cit.* p. 23.

[57] Interview with Youssef El-Gheriani, Director of the Greco-Roman Museum of Alexandria, 7 May 1979.

[58] Frost. *Loc Cit.* p. 128.

[59] *Ibid.*

[60] Strabo. Vol. VIII, p. 25.

[61] Fraser. Vol. I, pp. 19-20.

[62] Frost. *Loc Cit.* p. 128.

[63] *Ibid.*

[64] *Ibid.*

[65] Ibn Battuta. *Travels in Asia and Africa 1325-59.* Trans. H.A.R. Gibb, London, 1929.

[66] *Ibid.*

[67] Remote Viewing transcript, Respondent R3, 17 October 1979

[68] Composite Analysis Map, Probe II, 17 October 1979.

[69] Strangely, given its fame, there is no clear source from antiquity which provides the dimensions of the lighthouse, nor more than generalities concerning its appearance

[70] Interview with Captain Moshen El Gohary, AREN (Ret.), Director Red Sea Divers Service, 9 April 1979. Captain Gohary proved to be the best source *by far* concerning diving information in Alexandrian waters.

[71] Mobius Medical Advisor, Donald Zimmerman, M.D., M.E.E. recommended injections of Gamma Gobolin B, Tetanus, Typhus, and Cholera, as minium protection for diving in the hazardous littoral waters of Alexandria.

[72] Interview with M. Rodziewicz, 17 Nov. 1979.

[73] Frost. *Loc Cit.* pp. 128-129.

[74] *Ibid.*

[75] *Ibid.*

[76] Strabo. *Loc Cit.* p. 39.

[77] Plutarch. *The Lives of the Noble Grecians and Romans.* Trans. Greek to French by James Amyot; trans. French to English by Thomas North. Text prepared by Rolan Baughman.

(Heritage Press: New York, 1941), vol. II, pp. 1756-57.

[78] Mahmoud Bey. *Loc. Cit.*

[79] *Ibid.*

[80] Fraser. Vol. II, p. 21, *cf* 36.

[81] Ammianus Marcellinus. *The History Of.* (Surviving Books). Trans. John C. Rolfe. (Harvard University Press: Cambridge, 1950), vol. II, pp. 299-301.

[82] Fraser. Vol. I, p. 10.

[83] Remote Viewing Transcript, Respondent R4, response to Map Probe II, 17 Oct 1979.

[84] Remote Viewing Transcript, Respondent R9, response to Map Probe II, 17 Oct 1979.

[85] Remote Viewing Transcript, Respondent R1, response to Map Probe II, 17 Oct 1979.

[86] Interviews with Rodziewicz and Daoud 21 Nov 1979.

[87] Strabo. Vol. VIII, p. 39.

[88] On site Respondent interview April 1979. Map Probe II, 17 Oct 1979.

[89] On site Respondent comment, R3, volunteered 8 Apr 1979

[90] Remote Viewing Transcript, R4. Map Probe II, 17 Oct 1979.

[91] *Ibid.*

[92] Strabo. Vol. VIII, p. 39.

[93] Remote Viewing Transcript, Respondent R5, response to Map Probe II, 17 Oct 1979.

[94] Remote Viewing Transcript, Respondent R3, response to Map Probe II, 17 Oct 1979.

[95] Remote Viewing Transcript, Respondent R8, response to Map Probe II, 17 Oct 1979.