

Pharaohs' Harbors: Early Pharaonic Ports on the Red Sea Coast

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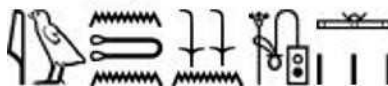


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PHARAOHS' HARBORS: EARLY PHARAONIC PORTS ON THE RED SEA COAST

The Red Sea region is a body of water that bisects the world's most extensive arid zone, the Saharo-Arabian desert, yet no large river systems flow directly into the Red Sea itself.¹ Today, there are three known early pharaonic Egyptian harbors that are situated on the western Red Sea coast. All were constructed before the New Kingdom, the earliest possibly by the 3rd dynasty but definitively by the reign of Khufu in the 4th dynasty of the Old Kingdom (fig. 1). Two of the three early pharaonic harbors, Wadi el-Jarf and Ayn Soukhna, are known to have been ports the Egyptians used to venture north into the Sinai on mining expeditions. From the southernmost of the three ports, Mersa Gawasis, the Egyptians traveled south to reach the land of Punt, possibly as early as the Old Kingdom and clearly in the Middle Kingdom. These expeditions would have returned to Mersa Gawasis and crossed the Eastern Desert via the Wadi Hammamat back to the Nile Valley to Coptos.²

While the three ports on the Red Sea have several similar general characteristics that define a harbor, such as a set of storage rock-cut galleries, each site also contains elements that set it apart. For example, Wadi el-Jarf, the earliest chronologically of the three harbors, is significantly larger in size than the other two sites and contains three times as many galleries. Ayn Soukhna has several architectural features that are not found at either Wadi el-Jarf or Mersa Gawasis. Both Wadi el-Jarf and Ayn Soukhna were known to be launching points for mining expeditions to the Sinai. Do these two sites, then, have any defining elements that are not found at Mersa Gawasis, and vice versa? After introductory remarks detailing the discovery and archaeology at each of the three sites individually, the physical

¹ Facey 2004: 7.

² Fattovich 2012: 1-6; Tyldesley 1997: 145.

layout and functions of the Old Kingdom installations on the Red Sea will be examined and discussed. What do the materials found within the storage facilities suggest about the use of the sites? What architectural structures are present at all three sites? Are there features associated with only one or two out of the three harbors? Given that the Egyptians also traveled to Punt in the Old Kingdom, could Wadi el-Jarf or Ayn Soukhna have been feasible venture points for expeditions south to Punt? Finally, an examination will be conducted of how the three sites worked and interacted together over the course of the Old and Middle Kingdoms. This paper is a preliminary exercise in comparison between these three early pharaonic harbor sites, based on preliminary excavation reports that have been made available because of the exemplary early publications of new discoveries by the excavators. With subsequent excavations and fuller publications, many questions that remain concerning the sites will certainly be answered, and the conclusions that have been drawn thus far will surely be altered as more information concerning the sites becomes available.

WADI EL-JARF: THE OLDEST EGYPTIAN PORT

Wadi el-Jarf is on the bank of the Gulf of Suez opposite a Sinai fortress, El-Markha.³ The site of Wadi el-Jarf is located south of the Wadi Araba, 24 kilometers south of Zafarana near the foothills of the Galala Sud mountains and the Wadi Deir,⁴ covering an area approximately six kilometers east-west and four kilometers north-south; the site, furthermore, dates the earliest chronologically of the three known early ports along Egypt's eastern borders and the Red Sea. British explorers Sir John Gardner Wilkinson and James Burton, who first visited the site in 1823,

³ Tallet & Marouard 2014: 4. Field work at El-Markha has been conducted since 2000 by Gregory Mumford of the University of Toronto, field director of the Survey & Excavation Projects in Egypt: South Sinai. Mumford, G. *SEPE: Survey & Excavation Projects in Egypt*. "South Sinai: Bibliography. Bibliography for El Markha." Retrieved from <http://www.deltasinai.com/sepe-04.htm> (accessed August 2014).

⁴ Tallet, Marouard, & Laisney 2012: 400.

took notes about pottery fragments and a large complex of galleries.⁵ The site was again reported in the 1950s by François Bissey and René Chabot-Morisseau, two French pilots and amateur archaeologists who drew up sketches of the large gallery complex noted by Wilkinson and Burton and provided descriptions of other parts of the site; their work was halted, however, due to the political circumstances concerning the Suez region at the time.⁶ The current excavations at Wadi el-Jarf are a joint effort between the Université Paris IV, Assiut University, and the Institut français d'archéologie orientale (IFAO).

The site of Wadi el-Jarf is divided into six zones (fig. 2). Zone one is the location of two sets of galleries, along with a few ceramic deposits and kilns (fig. 3). Zones two, three, and four, located slightly northeast of the galleries, make up the camp areas (fig. 4). Zone five is further east near the Suez Gulf shore and is composed of a large structure, almost 60 meters by 30 meters in size, the largest structure along the Red Sea coast from the pharaonic period (fig. 5).⁷ Zone six is a feature unique to Wadi el-Jarf and has no preserved equivalent at either Ayn Soukhna or Mersa Gawasis. An L-shaped jetty (also known as a wharf or mole) extends east into the water for 160 meters before veering southeast for about 120 meters (fig. 6).⁸ The jetty is visible during low tide but is mostly underwater except for a portion that is anchored to the shore where the jetty begins. More remarkably, along the eastward-running portion of the jetty is a large assembly of limestone anchors in a “vast artificial anchorage zone of over 2.5 ha”⁹ made up of at least 21 limestone boat anchors found *in situ* along with at least four large jars that are identical to ones found on land. At this point, zones two and five have not yet been fully excavated.¹⁰ The

⁵ Tallet, Marouard, & Laisney 2012: 400.

⁶ Tallet 2013: 76-77.

⁷ Tallet 2012b: 152.

⁸ Tallet 2013: 79.

⁹ Tallet 2013: 79.

¹⁰ Marouard 2014. Also, see author's note in abstract.

focus of excavations has been mainly the extensive zone one where the nearly 30 rock-cut galleries are located, as well as an examination of the jetty in zone six.

In zone one, the remains of a closure system are present at each of the galleries' entrances.¹¹ Each gallery's entryway is narrowed by the presence of a limestone slab on one side of the entryway along with the presence of larger limestone blocks that were used to close the galleries' openings, located immediately outside of and off to the side of the entrances.¹² Not all of the galleries have been excavated, but the archaeological remains found thus far have corroborated the use of the galleries for storage, and an intensive study of the exterior of galleries G3 to G6 was undertaken. Each gallery appeared to have its own ramp made of recycled wood leading up to the entryway of the galleries – similar to ramps associated with the galleries at the other harbor sites¹³ – as well as a few large limestone blocks that make up the closure system that were marked with red-inked hieroglyphs, the same blocks located immediately outside the openings of the galleries along the edges of the wooden ramps. The name of Khufu was found in the red ink on blocks outside of gallery G6, establishing a date for the site and further corroborating previous ceramic analyses (discussed in detail below).¹⁴ The materials found within the G3 to G6 galleries suggest that they were used for storage of maritime equipment as well as other organic materials (different kinds of woods, textiles, and basketry) that could be stored and reused during future expeditions. The specific contents of the galleries will be discussed in greater detail below in comparison with the materials found in the galleries at Ayn Soukhna and Mersa Gawasis.

Besides the massive gallery complex, zone one also features evidence for local ceramic

¹¹ Tallet, Marouard, & Laisney 2012: 402.

¹² Tallet 2013: 78.

¹³ For Mersa Gawasis, see Fattovich and Bard 2007: 135; for Ayn Soukhna, see Tallet 2012b: 149.

¹⁴ Tallet, Marouard, & Laisney 2012: 406.

production based on ceramic deposits and kilns. The ceramic production is identifiable based on a characteristic type of fabric, Marl A3, and Tallet describes this type of clay as one that can range in colors from a pink-orange to an intense shade of green.¹⁵ While Bourriau describes the Marl A3 as “pale yellow...often with spots of pink from uneven firing,”¹⁶ Marl clays can also be “a cream or white colour...although the section may show pink or orange...[and] if fired to a high enough temperature...can become an olive-green colour.”¹⁷ This type of clay, along with other Marl variations and Nile alluvium clay, is also found at Mersa Gawasis. Marl A3 clay is cited as evidence for local ceramic production at that site, but the Marl fabrics are more prevalent in the Middle and New Kingdom periods at Mersa Gawasis than in the Old Kingdom.¹⁸ Marl fabric, specifically Marl A1 clay, furthermore, makes up many of the storage jars found in one of the galleries that also date to the Old Kingdom found at Ayn Soukhna.¹⁹ The types of vessels at Wadi el-Jarf are overwhelmingly similar in shape and size. The jars are squat and globular in shape, averaging 40 centimeters “de diamètre à l’épaule” and no more than 60 centimeters in height.²⁰ Deposits of these jars, believed by the excavators to have been intended for transportation and storage of water, were found in galleries G15A, G15B, and G23 in overwhelming quantities of 70, 63, and 188, respectively; these three galleries, therefore, seemed to have functioned solely for storage of these vessels.²¹ Tallet suggests that this standardized style is characteristic of jars used for storage during expeditions; this style, furthermore, appears to be a copying of forms seen in the Nile Valley and suggests a presence of professional potters at an administrative center at Wadi el-Jarf.²² A large quantity of the same kind of jars was also present in the Sinai and the Tell Ras

¹⁵ Tallet, Marouard, & Laisney 2012: 408.

¹⁶ Bourriau 1981; 14.

¹⁷ Bourriau, Nicholson, & Rose 2000; 122.

¹⁸ Manzo & Perlingieri (chapter 4) in Fattovich & Bard 2007.

¹⁹ Perunka 2010: 100.

²⁰ Tallet, Marouard, & Laisney 2012: 409.

²¹ Tallet, Marouard, & Laisney 2012: 409.

²² Tallet, Marouard, & Laisney 2012: 409.

Budran, the site that is directly opposite Wadi el-Jarf on the other side of the Suez Gulf.²³

Significantly, the forms of the ceramics found at Wadi el-Jarf are associated with those of the 4th dynasty, but also forms from the end of the 3rd dynasty.²⁴ The jars have late 3rd dynasty/early 4th dynasty forms that are comparable to assemblages found at Dahshur and Elephantine dating to the 4th dynasty reign of Snefru and to assemblages dating possibly as early as the late 3rd dynasty at Abusir and early 4th dynasty Giza.²⁵ Even if the pieces found on the surface of the site dated to Djedefre or Khafre, none of the pieces found thus far date to the 5th or 6th dynasty.²⁶ Tallet suggests that the globular form of the pottery is also similar to some vessels found at Buto, which would suggest an even earlier date associated with the 2nd dynasty. Tallet also briefly remarks that the same globular storage jars found at Wadi el-Jarf and were also present at Ayn Soukhna in gallery G10 and at the “Kom 14” sector there.²⁷

The epigraphic material discovered thus far has securely dated the site to the 4th dynasty by the presence of Khufu’s name on pieces of papyrus that were found wedged between the closure blocks in front of several of the galleries, on the closure limestone blocks, as well as on pieces of wood stored within the galleries.²⁸ Marked in red ochre on pieces of wood, the markings are possible instructions for reassembling boats.²⁹ A wall inscription from gallery G3 names a “scribe of the Fayum, Idu” *sš n š-rsy jdW*, but more remarkable is a mark on a block outside the gallery G6 that names Khufu:

²³ Tallet, Marouard, & Laisney 2012: 409.

²⁴ Tallet, Marouard, & Laisney 2012: 411.

²⁵ Tallet, Marouard, & Laisney 2012: 411, n. 33. For the Abusir material, the authors cite Bárta, Coppens, Vymazalová 2010, material concerning Abusir South/North Saqqara.

²⁶ Tallet, Marouard, & Laisney 2012: 411.

²⁷ Tallet, Marouard, & Laisney 2012: 410 n. 30.

²⁸ Tallet, Marouard, & Laisney 2012: 412.

²⁹ Tallet, Marouard, & Laisney 2012: 412.

šmsw ꜥpr ḥnmw-ḥwf-wj jntj.s

The crew escorts of Khenemu-khuf-wj (Khufu), Inti.³⁰

Other blocks outside of galleries G3, G4, G5, and G6 have markings as well. Many of the storage jars in galleries G15A, G15B, and G23 also have hieroglyphic inscriptions, some of which may allude to the Falcon of Gold name of Khufu, *rḥw bjkwy nbw*,³¹ an inscription that is attested 26 times. The Golden Horus name of Khufu is *bjk nbw*, two falcons on the hieroglyph for gold,³² and the *rḥw* in the aforementioned inscription may be an imperfective participle where the verb, *rḥ* meaning “to know,” can be translated as “those who know.”³³ The inscription could then be translated as “those who know the golden falcons.” Two other inscriptions are attested 39 times (a variation of *wr m3j* or *wr m3j.s*, “the lion is great”) and 59 times (the name of an individual, Ma-werer, followed by a title or adjective).³⁴ At this point, however, the papyri are unpublished and more in-depth analysis of the texts is beyond the scope of the study of this paper.

Even after just a few field seasons, it is clear that Wadi el-Jarf was a harbor used for expeditions, likely to mining regions in the southern Sinai that are only 50 kilometers away.³⁵ The presence of a fresh water source near the camping zones would have been important when establishing the location of the site,³⁶ especially if people inhabited the region for long periods of time, rather than using Wadi el-Jarf solely as a temporary stop-off point before heading back

³⁰ Tallet, Marouard, & Laisney 2012: 415.

³¹ Tallet, Marouard, & Laisney 2012: 418.

³² Von Beckerath 1984: 53.

³³ Faulkner 1962; Allen 2000: 324 § 23.6.

³⁴ Tallet, Marouard, & Laisney 2012: 419.

³⁵ Tallet, Marouard, & Laisney 2012.

³⁶ Marouard 2014; Tallet, Marouard, & Laisney 2012: 425. Tallet et al. only mention the fresh water in the conclusion of their report and do not give a specific location for the fresh water source – “Un autre atout majeur de site est la présence abondante d'eau douce dans la région, et il semble très probable que la proximité de la source aujourd'hui utilisée par le monastère de Saint-Paul...a été un élément déterminant dans le choix de cette implantation.”

to the Nile Valley. It appears that based on the ceramic evidence, Wadi el-Jarf was likely established earlier than the epigraphic material suggests, and that the epigraphic material represents the later stages of the harbor site, rather than its beginning. The dating of the site to the 4th dynasty coincides with the implementation of royal projects on an unprecedented scale in the Nile Valley.³⁷ Tallet alludes to the idea that the monumental scale of the buildings being erected in the Nile Valley seems to have been mirrored at Wadi el-Jarf, given its size compared to the other Red Sea coast harbors of Ayn Soukhna and Mersa Gawasis.³⁸ The Egyptians had the resources to construct a large harbor site from which to conduct expeditions. Finally, Tallet suggests that the termination of Wadi el-Jarf as a harbor and the construction of Ayn Soukhna may be that the Wadi el-Jarf moved north because of Ayn Soukhna's proximity to the Memphite region.³⁹ Besides being closer to the Memphite region, Ayn Soukhna's location has other advantages, including a natural harbor sheltered from the prevailing north wind and a lack of coral reefs.⁴⁰ The shelter and absence of coral would make it easier to set sail from the shores without fighting the wind or running aground against coral and damaging the hulls of boats.

Materials in the Galleries at Wadi el-Jarf

Wadi el-Jarf has two distinct groups of rock-cut galleries that have been identified and mapped thus far, totaling approximately 28 galleries or more if the double galleries (G1, G15, and G28) are counted as two (fig. 3). The first group of galleries, located slightly farther north than the second group, is made up of 17 galleries (G1 through G17) and contains two double galleries, G1 and G15. This first group cuts into the base of a small hillock. The second group of galleries is

³⁷ Tallet, Marouard, & Laisney 2012.

³⁸ Tallet, Marouard, & Laisney 2012.

³⁹ Tallet, Marouard, & Laisney 2012: particularly n. 106 on p.426.

⁴⁰ Tallet 2009: 699.

made up of nine individual galleries (G 19 through G28; the numbers G18 and G27 were not assigned) that are arranged somewhat linearly with an east-west orientation, dug into the western side of a small north-south-oriented wadi (fig. 3). The galleries at Wadi el-Jarf average 20 meters in length, three meters wide, and two meters high – about the same length of the Mersa Gawasis galleries but slightly taller – with gallery G3 running over 30 meters in length. Thirteen galleries thus far have been cleared, and four of these, galleries G3, G4, G5, and G6, were intact and have been fully excavated.⁴¹

Within galleries G3 through G6, archaeological remains of worked cattle horns, ceramics, and ashy concentrations with small hearths and small fragments of papyri have been identified.⁴² Tallet notes the absence of animal bones associated with consumption throughout the rest of zone 1, yet comments on how worked cattle horns were found “en grand nombre dans toutes les galleries,” cut at the base of the horn, regularly pegged to wood and incised; whether these horns were decorative or functional, still is unclear.⁴³ Gallery G4 contained over 50 fragments of reworked wood, some pieces still containing mortises and ligatures as well as red ink marks. Over 250 splinters of acacia, tamarisk, and sycamore have been identified, as well as 15 tenons, dowels, trim elements, and over 125 pieces of rope. Large pieces of cloth were coated in a black substance, possibly bitumen or resin. The archaeological remains within this gallery suggest a usage associated with storage of maritime boat elements, a usage like the galleries at Ayn Soukhna that also contained maritime parts (discussed below). Because the Ayn Soukhna wood remains were burnt, no ink marks that would correspond to the assemblage of the boat planks within the two galleries survived, but given that these boats were also disassembled, it would seem probable that these potential hull pieces also had construction markings like those on the

⁴¹ Marouard 2014.

⁴² Tallet, Marouard, & Laisney 2012: 405.

⁴³ Tallet, Marouard, & Laisney 2012; 405, n. 15.

Wadi el-Jarf wood pieces, and the Wadi el-Jarf boats could probably be assembled and disassembled in a fashion like the Ayn Soukhna boats.⁴⁴

THE PORT SITE OF AYN SOUKHNA

Ayn Soukhna, a site whose name means “hot spring” in Arabic, lies on the western coast of the Gulf of Suez, approximately 120 kilometers east of the Memphite region.⁴⁵ Since 2001, Ayn Soukhna has been excavated by a joint team from the Institut français d’archéologie orientale (IFAO) and the University of Paris-Sorbonne.⁴⁶ The archaeological site itself covers an area approximately 500 meters by 300 meters between the Galala el-Bahariya mountains and the modern coastal road to Hurghada (fig. 7). Upon a nearby cliff face overlooking the site are over fifty inscriptions, written in hieroglyphs, hieratic, Greek, and Coptic, suggesting the widespread use of the site over a long period of time; many of the inscriptions date to the Middle Kingdom, ranging from the late 11th dynasty to the end of the 12th dynasty, but there are also quite a few texts dating to the early New Kingdom.⁴⁷

Ayn Soukhna was first recognized by Mahmud Abd el-Raziq in 1999 as an ancient site when he noted inscriptions carved into the rock face.⁴⁸ He compared these inscriptions to those found at Serabit el-Khadem, a site in the south Sinai, and found several similarities between the texts, such as the names of three officials – an Ity, Senusret-Seneb, and Imeny – in texts dating to the second year of the reign of Amenemhat III.⁴⁹ A few noteworthy stelae from Abd el-Raziq’s observations dated to the reigns of Mentuhotep IV and Amenemhat III and were clearly official

⁴⁴ “Some signs in red or black colour and others incised in the wood” were also found on the Khufu Giza boat. See Nour, Iskander, Osman, & Mustafa. 1960. *The Cheops boat*. Cairo. 8 fig. 3.

⁴⁵ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 3.

⁴⁶ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 3.

⁴⁷ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 4; Tallet 2012c.

⁴⁸ Abd el-Raziq 1999.

⁴⁹ Abd el-Raziq 1999: 128.

records of expeditions sent out to obtain turquoise and copper.⁵⁰ The text of Mentuhotep IV is the oldest of the rock-face inscriptions, and below the king's titulary, three columns outline an expedition undertaken from this site.

*rnpt-zp I: jwt mšc n nswt tnw mšc pn 3000 n s r jnt mfk3t bj3 jnw nb nfr n h3st*⁵¹

Regnal year one, arrival of the king's expeditionary force; workforce of 3000 to bring back turquoise, copper, bronze, and all fine products of the desert.⁵²

The Egyptians obtained turquoise only from the Sinai, and the text corroborates a connection between Ayn Soukhna and the Sinai Peninsula.⁵³ Other texts also had clear Middle Kingdom associations, dating to the reigns of Amenemhat I and Senwosret I; yet, while the texts strongly suggested that Ayn Soukhna was indeed a "stopping-off point" to the Sinai, they did not make clear whether the site was a port, since troops could have used land routes rather than crossing the Gulf of Suez.⁵⁴ The archaeological finds from Ayn Soukhna that confirmed that the site was a harbor were the burnt boat remains found in galleries G2 and G9.

Excavations at Ayn Soukhna thus far have revealed the presence of nine (or ten) galleries (fig. 8).⁵⁵ Located 500 meters from the shore, the galleries were dug into the base of the same mountain that has the engraved rock face. These galleries are all relatively rectilinear, averaging 2.5 meters wide, 2 meters high, and varying in length from 15 to 20 meters. Most of the galleries

⁵⁰ Abd el-Raziq 1999: 129.

⁵¹ Abd el-Raziq, Castel, Tallet, & Ghica 2002: 40.

⁵² Abd el-Raziq, Castel, Tallet, & Marouard 2012: 4.

⁵³ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 4.

⁵⁴ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 4-5.

⁵⁵ Tallet 2012b. The number of galleries, nine or ten, is inconsistent through several publications, including within compilations. *The Red Sea in Pharaonic Times* (2012) has one chapter that says ten galleries yet another chapter that says nine. Abd el-Raziq, Castel, & Tallet's 2006 chapter in *Égypte, Afrique & Orient* 41 also says nine galleries, yet Tallet's publication in the *British Museum Studies in Ancient Egypt and Sudan* 18 states ten galleries. From the map provided in the publications, nine galleries are clearly discernible. I am unsure of where the tenth gallery is located.

were originally outfitted with doors and ramps.⁵⁶ Six of the galleries run roughly parallel to each other, oriented east-to-west, and three of these are fronted by a lean-to structure (fig. 9). The lean-to structure is approximately 13 meters by 4 meters, is accessible by an east-facing door that opens into a hallway, and was covered by a roof that was supported by wooden columns, the insertion holes for which are still visible in the ground.⁵⁷ The excavators believe that the galleries as well as the lean-to structure were not only meant for storage but also for living quarters.⁵⁸ Tallet postulates that these galleries were dug during the Old Kingdom and reused during the Middle Kingdom for storage of equipment and supplies needed for expeditions to the Sinai, dates that are based on the ceramic finds.⁵⁹

There is an abundance of ceramic materials dating to the 12th dynasty, some pieces bearing hieratic ink inscriptions, within the galleries and lean-to structure. Ceramic remains also date Ayn Soukhna to the Old Kingdom; to reiterate a comparison made earlier when discussing the Wadi el-Jarf ceramic assemblage, a collection of storage jars numbering 20 to 25 (estimated figures due to the broken state of all the jars) dating to the Old Kingdom were found in Ayn Soukhna's gallery G5. The most prominent fabrics of the pottery found at Ayn Soukhna were the Marl C and Nile B2 wares.⁶⁰ Both the Nile B2 and Marl C fabrics are found at Mersa Gawasis,⁶¹ which, like Ayn Soukhna, was a site heavily used during the Middle Kingdom. Despite all the clear indicators associating the site with a Middle Kingdom occupation, there is also evidence available that corroborates the development and use of Ayn Soukhna during the Old Kingdom, particularly a "significant occupation of the site over the second part of the 4th dynasty."⁶² The end of the 4th

⁵⁶ Tallet 2012b: 149.

⁵⁷ Tallet 2012b: 149.

⁵⁸ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 8-9.

⁵⁹ Tallet 2012a.

⁶⁰ Perunka 2010.

⁶¹ Manzo & Perlingieri in Fattovich & Bard 2007.

⁶² Abd el-Raziq, Castel, Tallet, & Marouard 2012: 6.

dynasty is when Wadi el-Jarf seems to have been abandoned, and there may have been some overlap in occupation of Ayn Soukhna and Wadi el-Jarf.

Cylinder-seal impressions have been found at entrances of the Ayn Soukhna galleries, featuring the Horus names of Khafre, Niuserre, Djedkare, and Unas.⁶³ The name of King Djedkare-Isesi, furthermore, was discovered on sealings at an unspecified location at the site, also contributing to the epigraphic material dating to the Old Kingdom.⁶⁴ Along with cylinder-sealings, inscriptions that pre-date the aforementioned rock inscriptions were excavated near the entrances of several galleries along with ceramic pieces from large broken storage jars dating to the Old Kingdom. Excavations have also turned up at least five official inscriptions dating to the Old Kingdom, one from gallery G9 mentioning the “terraces of turquoise,” *htjw mfk3t*, followed by a list of officials, particularly noteworthy are different military groups and an “inspector of carpenters,” *shd mdhw*.⁶⁵ Two official inscriptions were discovered in the entrances of galleries G6 and G1, but the galleries had not been fully excavated due to their poor preservation. The presence of Old Kingdom epigraphic material, the Old Kingdom-typed storage jars, as well as the metal workshops that also date to the Old Kingdom (discussed below) explain why Tallet dates the galleries initially to the Old Kingdom.

The lower portion of the archaeological site, nearest the coastline, has been under rescue excavation since 2006 because of the threat of modern development. Within this area is a zone of installations that were occupied as early as the Old Kingdom, physically divided by a thick layer of rock into upper and lower sections. This area has been designated the “Kom 14” sector

⁶³ Abd el-Raziq, Castel, Tallet, & Marouard 2012; Perunka 2010 specifically states the finds of clay sealings of Khafre and Niuserre in front of gallery 10 (although where gallery 10 is located is not clear on the map of the site).

⁶⁴ Tallet 2012a.

⁶⁵ Abd el-Raziq, Castel, Tallet, & Marouard 2012. For more detailed information regarding these specific inscriptions, see Tallet 2012c.

and has several levels of occupation, beginning with a single occupation in the Old Kingdom and followed by a hiatus and then three successive Middle Kingdom phases (fig. 10). The earliest Middle Kingdom phase consists of hearths and makeshift installations – the term installation differing from gallery at this site – of a temporary camp, dating to the end of the 11th dynasty and the beginning of the 12th dynasty.⁶⁶ The third phase (the second Middle Kingdom phase is not discussed by the excavators) is marked by workshops for copper reduction and the reoccupation of the Old Kingdom facilities with artifacts dating to the mid- to end of the 12th dynasty.

During the Old Kingdom occupation, a large storage building was constructed; this feature is the largest structure at Ayn Soukhna discovered thus far, measuring 14 meters by 16 meters, and is made of blocks of mortared clay. Within the upper division of the Kom 14 structure, there are 15 smaller rooms arranged around an original 6.2 square meter structure featuring baking and butchering facilities as well as kitchens and possibly habitation units.⁶⁷ The ceramic deposits date to the 4th and 5th dynasties, and cylinder-seal impressions with the Horus name of Unas “confirms the synchronous occupation” of this Kom 14 sector with the rock-cut gallery complex.⁶⁸ The largest Ayn Soukhna structure, however, is still significantly smaller than the large zone five intermediary building that measures almost 60 meters by 30 meters at Wadi el-Jarf.

At Ayn Soukhna, a long, east-west oriented pit that lies 200 meters from the present coastline, 17.5 meters long by 1.9-2.2 meters wide with a maximum height of 2.3 meters, is considered the “most remarkable element in sector 14.”⁶⁹ This pit has what the excavators

⁶⁶ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 8-9.

⁶⁷ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 9.

⁶⁸ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 9.

⁶⁹ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 9.

consider to be a definite boat-like shape that narrows sharply at eastern end, and post-holes can be seen in the front of the pit and along the southern side (fig. 11). The excavators suggest that this boat pit may have been where seafaring ships were assembled and dismantled. Such a pit would have been particularly accommodating for large ships that may have been more difficult to assemble in a desert environment; this would further support the notion of Ayn Soukhna as an embarkation and disembarkation point during the Old Kingdom. It is noteworthy, furthermore, that this boat-pit is much closer to the shoreline than the gallery complex. In a later discussion, it will be noted that the industrial areas at the harbors tend to be located much closer to the coastline than the storage facilities. At Ayn Soukhna, if this boat-pit were in fact used for assembling and disassembling boats, then the boat parts could be more easily moved, rather than somehow maneuvering an entire intact boat across the desert to or from the galleries.

Excavations of two storage galleries used for dismantled boats, along with the boat-like pit from the Kom 14 sector, have confirmed the use of Ayn Soukhna as a port site that functioned in conjunction with mining expeditions to the Sinai Peninsula. Of the group of six galleries that run parallel to each other, oriented southwest-northeast and open to the north towards the sea, three of the galleries – G2, G8, and G9 – are not enclosed in the lean-to structure. Galleries G2 and G9 contained remains of charred wood pieces, the remains of two distinct boats, both 14 to 15 meters long.⁷⁰ Gallery G8 does not seem to have been excavated, based on the lack of detailing on each plan of the site and the absence of information concerning that gallery in any of the reports. It would be interesting to see if G8, the third gallery that is not enclosed in the lean-to structure also contains boat remains. The lean-to structure's entrance is an east-facing doorway, which would have required navigation through a narrow entrance before entering the area immediately outside of galleries G4, G5, and G7. With galleries G2, G8, and G9 unhindered by the

⁷⁰ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 5.

lean-to structure, it would be easier to enter directly into these galleries to either store or remove goods and dismantle and remove boats (if the latter activities did not occur in the boat-pit); the galleries enclosed in the lean-to structure might have served as storage spaces for boats, but I would suggest that the three galleries without such a structure would be easier to access, while the three galleries that are protected by the lean-to structure would better serve as living quarters or storage for smaller items (for example, as gallery G5 seemed primarily to have been used for storage jars⁷¹). The lean-to structure only measures about 13 meters by 4 meters,⁷² and the burnt wood pieces in total measured nearly 13 meters by over 2.5 meters,⁷³ which would make it next to impossible to navigate the assembled wooden planks into the lean-to structure and then make the right-angled turn into the galleries enclosed by the lean-to structure. The Ayn Soukhna boats found in galleries G2 and G9 were likely used for mining expeditions into Sinai, based on the presence of the reduction kilns and copper ore, as well as the numerous inscriptions referring to the turquoise and copper. These expeditions likely ventured to the region of Serabit el-Khadem, specifically, based on similarities between the names (three officials, Ity, Senusret-Seneb, and Imeny, dating to the second year of the reign Amenemhat III) mentioned in Serabit el-Khadem and Ayn Soukhna inscriptions noted by Abd el-Raziq.⁷⁴ The Ayn Soukhna boats were probably shuttle boats that could have ferried workers to and from the Sinai Peninsula and transported cargoes of ore.⁷⁵

Along with the galleries, several metal workshops (fig. 12), primarily copper workshops dating to the Middle Kingdom, have been located next to the storage galleries as well as in a lower area of the site. Five workshops have been studied thus far, and excavators can now model the

⁷¹ Perunka 2010.

⁷² Abd el-Raziq, Castel, Tallet, & Marouard 2012: 5.

⁷³ Pomey 2012: 36.

⁷⁴ Abd el-Raziq 1999.

⁷⁵ Pomey 2012: 46-47.

smelting process that was used in the reduction of copper ore, also known as malachite.⁷⁶ One of the excavated workshops, designated copper workshop 1, has a rectangular shape and is oriented east-west with four small openings on the western end for ventilated furnaces. In addition to these furnaces, the workshop contains low stone tables located on the ground that were used for crushing and pounding slag before the slag was sifted. There are also remains of crucibles that were heated in horseshoe-shaped furnaces on the eastern end within the workshop, opposite the western furnaces.⁷⁷

Copper ore reduction furnaces had already been discovered in the Sinai Peninsula, dating back to the Early Dynastic period, yet Ayn Soukhna's furnace system is different from the others; the ventilating systems and "inner dimension of the hearths" are consistent with earlier models but the heating chambers are much larger.⁷⁸ The excavators believe this new layout allowed for an improved conservation of heat as well as for the processing of ore in larger quantities.⁷⁹ The furnaces were built in sets of four, which suggests an "extremely standardised workflow," with the use of modular units.⁸⁰ Parallels to uniform units for mass production of products can be seen at Giza in the bakeries excavated in the early 1990s; instead of constructing a larger bakery for baking greater quantities of bread for a larger workforce, there were multiple replicated bakeries.⁸¹ While Ayn Soukhna may have been used from the Old Kingdom to the New Kingdom, metallurgy and metalworking seems to have been limited to the Middle Kingdom only. The excavators have raised an important issue that is still being researched: what was the origin of the ore used in the workshops and the fuel required for the reduction and smelting processes?

⁷⁶ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 7.

⁷⁷ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 7.

⁷⁸ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 7.

⁷⁹ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 7.

⁸⁰ Abd el-Raziq, Castel, Tallet, & Marouard 2012: 7.

⁸¹ Lehner 1997; Lehner 2014.

There is also the issue of an ore deposit. The suggestion that the ore was imported from the Sinai Peninsula is based on research that has been conducted *in situ*, and the excavators suggest that Ayn Soukhna, besides being a coastal port site, may have been a “conjunction point between ore and fuel” at some point during the Middle Kingdom.^{82,83} Among the three port sites, however, this fuel and ore issue seems to relate only to Ayn Soukhna, since there are no copper smelting workshops at Wadi el-Jarf and Mersa Gawasis.

The Galleries at Ayn Soukhna

The archaeological remains that are highlighted from the nine (or ten) galleries⁸⁴ at Ayn Soukhna are the burnt boat remains found in galleries G2 and G9, remains which confirmed the use of Ayn Soukhna as a harbor; these two galleries were clearly intended as storage facilities for the dismantled ships. As already discussed, gallery G5 also served as storage for jars,⁸⁵ and many of the pieces of ceramics and sealings used to date the site were found within or in front of the galleries. Gallery G2 contains the charred remains of stacks of planks (possibly hull planks) as well as smaller construction pieces such as ligatures, tenons, matting, and rope, all elements used in boat construction.⁸⁶ Excavations in gallery G9 also revealed the presence of charred wood and rope belonging to a boat inside. As is the case with gallery G2, the majority of gallery G9’s pieces

⁸²Abd el-Raziq, Castel, Tallet, & Marouard 2012: 8.

⁸³ Lucas 1962 discusses how the main two regions from which the Egyptians obtained copper ore were the Sinai and Eastern Desert. In the Sinai, particularly at the site of Magareh, in the Old Kingdom there was a “great amount of copper slag and waste scraps from smelting” and in the Middle Kingdom there was also “a great amount of copper slag” (202). In the Eastern Desert, the Wadi Araba [which is located north of Wadi el-Jarf] contained small deposits of copper but possibly was not mined until the New Kingdom, later than the period in which the metal workshops at Ayn Soukhna were used. Lucas, furthermore, remarks that ore could be easily obtained from surface deposits and would not need a lot of elaborate tools until surface deposits were depleted and underground mining would need to be undertaken. Perhaps some of the sites where the presence of copper deposits is more ephemeral is because the Egyptians underwent minimal underground mining and relied heavily on surface deposits.

⁸⁴ See footnote 47 for clarification.

⁸⁵ Perunka 2010: 100.

⁸⁶ Pomey 2012: 36-39.

appear to correspond with hull planking, and the same assembly elements consisting of single mortise-and-tenon joints, double mortise-and-tenon joints, L-shaped mortises for single-point lashing, and dowels.⁸⁷ Rope is also in the assemblage as well as possible parts of oars.⁸⁸ Radiocarbon dating on select gallery G2 samples demonstrated that the majority of the planks are made of cedar and the structural pieces were made of Egyptian wood, such as acacia.⁸⁹ Structural elements seemed to have been typically made of more expensive, imported wood (typically cedar) and assembling elements were made of common Egyptian woods. Pomey suggests that an unpegged technique associated with lashing would allow for the dismantling of a boat, an unlocked technique also seen at Mersa Gawasis. Boats were also constructed using a sewing technique where the hull planks are stitched together with rope; this sewing technique was used with the Khufu boats, which also used mortise-and-tenon joints throughout the hull.⁹⁰ Dismantling may imply that the boats were not in continuous use on the Red Sea and therefore could be stored in galleries or carried back to the Nile Valley.⁹¹ Tallet suggests that the fires that charred the two galleries' boat remains were set deliberately and simultaneously in order to halt maritime operations out of Ayn Soukhna,⁹² and the broken storage jars in gallery G5 were also thought to have been smashed deliberately.⁹³

THE PORT AT MERSA GAWASIS

The latest chronologically of the three known Egyptian harbor installations that date to the pharaonic period was the first to be discovered and identified as an early pharaonic Egyptian

⁸⁷ Pomey 2012: 41-44.

⁸⁸ Pomey 2012.

⁸⁹ Pomey 2012: 43.

⁹⁰ Lehner 1997.

⁹¹ Pomey 2012: 46.

⁹² Tallet 2012a.

⁹³ Perunka 2010.

port. The site of Mersa Gawasis was originally identified as the Roman port of Philoteras.⁹⁴ A.M.A.H. Sayed mentions that Sir Gardiner Wilkinson and Mr. James Burton (the same pair involved in Wadi el-Jarf) came across a group of small buildings in the Wadi Gasus, approximately 60 kilometers north the port of Quseir.⁹⁵ The two British men discovered two stelae inscribed with hieroglyphs, one belonging to a high official Khnumhotep and dating to the first regnal year of Senwosret II, which mentions the establishment of monuments in *t3-ntr*, “God’s Land,” a term that was often used to refer to Punt. The other stela records the 28th regnal year of Amenemhat II and belonged to a ship’s captain named Khentekhety-wer; the stela mentions a safe return of an expedition from a sea voyage to Punt and that his ships landed at a port called *s3ww*, Saww. This second stela was not found on the Red Sea coast itself, but about seven kilometers from it, which led Wilkinson and Burton to believe that the port of Saww was the “present small dhow harbour of Mersa Gasus.”⁹⁶ Sayed began excavations in the mid-1970s that lasted two seasons. He originally investigated the Wadi Gasus valley (which lies approximately 20 kilometers south of the modern port of Safaga) at a Roman station but moved to the Wadi Gawasis when nothing pre-Graeco-Roman was found.⁹⁷ Mersa Gawasis, the harbor at the end of the Wadi Gawasis, lies two kilometers south of Mersa Gasus. Mersa Gawasis harbor is overlooked by a small plateau approximately 10 meters above sea level, on which Sayed noticed a series of small mounds and shallow pits, whose foundations were made of stone.⁹⁸

At Mersa Gawasis, Sayed discovered a limestone chip bearing “two half mutilated cartouches” of Senwosret I.⁹⁹ Also found were five small, eroded round-topped stelae that

⁹⁴ Fattovich & Bard 2012: 21.

⁹⁵ Sayed 1977: 141.

⁹⁶ Sayed 1977: 141.

⁹⁷ Sayed 1977: 69-70.

⁹⁸ Sayed 1977: 149.

⁹⁹ Sayed 1977: 150.

preserved remnants of standing figures similar to Khentekhety-wer's. West of Mersa Gawasis are scattered mounds, one mound approximately 250 meters from the port which contained a limestone shrine inscribed with hieroglyphs. Sayed and his workers had discovered what appeared to be a memorial stela taking the form of a shrine on which the name Ankhaw (*ʿnhw*), along with a short inscription containing the name of Senwosret I and mentioning an expedition to Bia-Punt.¹⁰⁰ Inscriptions on Ankhaw's shrine-stela also mentioned a unique title, *ʿd-mr nnw* "Administrator of the Ocean [Waters]."¹⁰¹ The shrine-stela of Ankhaw was constructed of two pairs of limestone anchors. The four anchors at Ankhaw's shrine were arranged into two rows, and in the second season two more anchors were found under Ankhaw's shrine and an anchor at the shrine of another individual named Antefoker,¹⁰² located another 200 meters west of Ankhaw's and also dated to Senwosret I.¹⁰³ Near the stela of Antefoker, Sayed found potsherds inscribed with hieratic in black ink and potsherds inscribed with both hieroglyphs and hieratic (he does not mention, however, what the inscriptions say or why he thinks they are significant in terms of Mersa Gawasis being a harbor in either his 1977 or 1978 publications), as well as two unfinished limestone anchors that were smaller than those of Ankhaw and Antefoker. Another small limestone anchor, pieces of wood and mortises, and a small copper or bronze chisel along with some broken chisel heads were also found.¹⁰⁴ Sayed's discovery defined Mersa Gawasis as a pharaonic, Middle Kingdom 12th dynasty port.¹⁰⁵ It was identified as the pharaonic Egyptian port of Saww based on Khentekhety-wer's and Ankhaw's stelae.¹⁰⁶ The discovery of anchors was

¹⁰⁰ Sayed 1977: 150.

¹⁰¹ Sayed 1978: 71.

¹⁰² Sayed 1978: 71.

¹⁰³ Sayed 1977. Sayed gives detailed translations of the hieroglyphs found on the shrine-stelae for Ankhaw and Antefoker in his article.

¹⁰⁴ Sayed 1978: 71.

¹⁰⁵ Sayed 1977: 173.

¹⁰⁶ Sayed 1977: 141, 175.

the first example of Egyptian anchors found on Egyptian shores,¹⁰⁷ yet the submerged anchors around the jetty of Wadi el-Jarf are the only Egyptian anchors to have been found *in situ*.¹⁰⁸

Following Sayed's excavations, Alessandra Nibbi and Honor Frost visited Mersa Gawasis in the late 1970s and 1991, respectively, Nibbi denying that Mersa Gawasis was a port and Frost agreeing with Sayed.¹⁰⁹ Since 2001, Mersa Gawasis has been excavated by the University of Naples "L'Orientale" (UNO), the Italian Institute for Africa and the Orient (IsIAO), and Boston University (BU) (fig. 14). The excavators wanted to focus on maritime trade along the Red Sea, specifically regarding the land of Punt, during the 3rd-2nd millennia BCE; Mersa Gawasis was selected because it had already been identified as a potential harbor from which seafaring expeditions were sent.¹¹⁰

The site of Mersa Gawasis,¹¹¹ approximately 650 meters east-west by 320 meters north-south is divided into three basic sectors (or slopes or terraces): eastern, southern, and western (fig. 13).¹¹² The western slope is at the base of the western terrace and the location of the larger of the two gallery groupings. These terraces coincide with the natural rock and coral formations that are at the site.¹¹³ The eastern terrace lies between the shoreline and the modern coastal road while the western terrace, despite being located between a railroad and the desert, is still preserved "by the collapse of coral from the terrace and accumulation of wind-blown sand."¹¹⁴

¹⁰⁷ Sayed 1977: 177.

¹⁰⁸ Tallet, Marouard, & Laisney 2012: 422.

¹⁰⁹ Fattovich & Bard 2012: 21.

¹¹⁰ Fattovich & Bard 2007: 17.

¹¹¹ Technically, the eastern sector nearest the shore is Mersa Gawasis and the western section between the modern railroad and the wadi is Wadi Gawasis (Fattovich 2012). Mersa and Wadi, however, are used interchangeably throughout the reports for the name of the site.

¹¹² Fattovich & Bard 2007: 29.

¹¹³ Fattovich & Bard 2007: 61.

¹¹⁴ Fattovich & Bard 2007: 28.

At Mersa Gawasis, at the top of the western coral terrace, light structures made of mats and wooden poles were erected.¹¹⁵

In just the first few years of excavations, over 20,000 fragments of pottery had been found; this abundance of material indicates a long-term use of the site.¹¹⁶ As at Wadi el-Jarf, there is the presence of the Marl clay, which indicated locally manufactured pottery, but like Ayn Soukhna, at Mersa Gawasis the type of Marl clay was Marl C clay, as well as the presence of Nile alluvial clay.¹¹⁷ The Marl A3 strain that was found at Wadi el-Jarf was also present at Mersa Gawasis.¹¹⁸ The majority of the shapes of the vessels at Mersa Gawasis were large-mouthed storage jars, as well as medium-sized jars, bottles, plates, and medium and small bowls. There are graffiti on many of the pots, including an idiosyncratic boat graffito found on several jars that suggest that the potters knew the vessels were destined for a maritime expedition.¹¹⁹ There seem to be pottery-making areas in a few locations (although Fattovich and Bard do not specify further) as well as ceramic tools, mostly scrapers. While the prime use of Mersa Gawasis dates to the 12th dynasty of the Middle Kingdom, the pottery evidence suggests the initial use of the site in the late Old Kingdom.¹²⁰ According to Manzo and Perlingieri, the only instances of late Old Kingdom/First Intermediate Period pottery occur in unit WG 10 and unit WG 28, Cave one, a significantly small area given the wide distribution of the Middle Kingdom pottery.¹²¹ The presence of Old Kingdom pottery in Cave one would mean that this cave at least would have had to been dug in the Old Kingdom as well. Cave one is the only cave at the site that contains the late

¹¹⁵ Fattovich 2012: 8.

¹¹⁶ Fattovich & Bard 2007: 101.

¹¹⁷ Fattovich & Bard 2007: 102-103.

¹¹⁸ Fattovich & Bard 2007: 103.

¹¹⁹ Fattovich & Bard 2007: 106.

¹²⁰ Fattovich & Bard 2007: 110.

¹²¹ Manzo and Perlingieri in Fattovich & Bard 2007; specifically, Table 3 in Chapter 4. Besides the references to this table and naming common clay fabrics that are typical of the Old Kingdom, the focus of the pottery is heavily on the Middle Kingdom types, and very little is said concerning the Old Kingdom pottery.

Old Kingdom/First Intermediate Period finds and is also one of the two galleries that is significantly smaller in size compared to the other galleries. Fattovich and Bard have thus far mapped eight galleries that were carved into the base of the western edge of the western coral terrace (fig. 14). Two galleries, cave one and eight, are designated as rooms rather than galleries due to their distinctly smaller dimensions compared to the other six galleries. Along with differences in size, caves one and eight are also outliers geographically compared to the other six galleries, located farther north along the western terrace. Other Old Kingdom material, if still in existence at the site, could merely be buried under the later material. Another suggestion is that the smaller caves, one and eight, were the first storage facilities that were used until the openings in the natural rock formation from which the other six caves originate was expanded by the Egyptians further and then used during subsequent years and expeditions. The larger grouping of caves is farther south along the western coral terrace and therefore closer to the harbor area and may have been easier to access geographically.

Along the southern slope, there is a region called the “harbor area,” believed to be an area where the members of seafaring expeditions camped and where their ships landed.¹²² The “harbor area” is also thought to have served a storage function based on the limited diversity of shapes of large storage vessels made mainly out of Marl C clay,¹²³ but the only feature present in the area is the natural rock shelter that was used by seafarers involved with the expeditions from Mersa Gawasis;¹²⁴ thus far, however, there has been no evidence of permanent architecture

¹²² Bard & Fattovich 2009; Fattovich 2012. Based on presence of large hearths, remains of fish, fragments of storage jars, and a pitted anchor.

¹²³ Bard & Fattovich 2009: 28.

¹²⁴ Fattovich 2012: 7.

found¹²⁵ besides the “caves” and the shrine-stelae made of limestone that were investigated by Sayed in the 1970s.¹²⁶

Materials and Features Found at the Mersa Gawasis Galleries

The galleries at Mersa Gawasis appear at first to be an assemblage of workshops and storerooms,¹²⁷ yet after a closer examination of the material remains found within the galleries, they seem to have served a more multifaceted function. Cave one contained fragments of a marl ware bowl, a shell bead, large potsherds of storage jars that had encrustations of salt, wood fragments, small pieces of linen, a conch shell, fish bones, and mud-bricks. While Bard and Fattovich only mention the salt-encrusted jars in passing, the presence of salt encrustations, if on the outside of the jars (Fattovich and Bard do not mention whether the salt was found on the inside or outside of the jar fragments) could point to the jars’ use on maritime expeditions to and from Mersa Gawasis to carry provisions that the Egyptians would have needed for long voyages. Given the distance the galleries are located from the Red Sea coast, it seems unlikely that the salt accumulation would have occurred from the sea air if the jars had only been used within the galleries. Cave two, measuring 24 meters long and four to five meters wide,¹²⁸ has been intensively studied and divided into three sections: an entrance corridor, room one, and an inner part.¹²⁹ Room one is the location of the access to galleries three and four, and the inner part has the access to cave five. Overall, the artifact assemblage consisted of fragments of rope coils and wood, charcoal remains, fragments of small ceramic cups, ship timbers used as a walkway or

¹²⁵ Fattovich 2012: 4.

¹²⁶ Sayed 1977; Sayed 1978.

¹²⁷ Fattovich & Bard 2007: 173.

¹²⁸ Bard, Fattovich, & Ward 2011: 9.

¹²⁹ Fattovich & Bard 2007: 62.

ramp, a rope bag, a grinding stone, and an accumulation of seeds, leaves, and insects.¹³⁰ Hearths were the most common feature found within the galleries as well. The rope bag found among seeds in cave two resembles bags represented in agricultural scenes in tombs, and it has been suggested that such bags were used to carry harvested wheat and barley.¹³¹ The bag may have carried grain into the galleries where it was then used to make bread. The bag, furthermore, was located near a grinding stone and a pestle, tools that further corroborate a possible food processing or production area.¹³²

Caves three and four are both 22 meters in length and less than two meters high.¹³³ They contained a diverse assemblage of materials and features. Cave three had small mammal bones concentrated at its entrance, along with an unspecified number of shallow hearths and charcoal pieces.¹³⁴ The inner part of the cave contained shells, fish bones, more charcoal, and wood fragments (some of which have been identified as parts of ships).¹³⁵ Cave four also contained concentrations of fish bones as well as naturally preserved fish, charcoal, potsherds, and a bread mold.¹³⁶ Hearths were features commonly found within caves three and four. Other areas within cave four also had large potsherds and ashy soil. Cave five or the “rope cave” contained a large quantity of coils of rope made of papyrus.¹³⁷ This cave measured slightly shorter than the other galleries, 19 meters in length, around four meters in width, and less than two meters high.¹³⁸ Along with the massive amounts of rope, cave five also contained fragments of wooden boxes.¹³⁹

While Bard and Fattovich suggest that the Mersa Gawasis galleries may have been used

¹³⁰ Bard, Fattovich, & Ward 2011: 10; Fattovich & Bard 2007: 62-65.

¹³¹ Fattovich & Bard 2007: 195.

¹³² Fattovich & Bard 2007: 195.

¹³³ Fattovich & Bard 2007: 66-67.

¹³⁴ Fattovich & Bard 2007: 66-67.

¹³⁵ Fattovich & Bard 2007: 66-67.

¹³⁶ Fattovich & Bard 2007: 67.

¹³⁷ Fattovich & Bard 2007: 194; Fattovich, Bard, & Ward 2011: 30.

¹³⁸ Fattovich & Bard 2007: 66-67.

¹³⁹ Fattovich & Bard 2007: 66-67.

as workshops and storerooms, there are also large quantities of other materials that could also be used to support the notion of the galleries as places that served as makeshift living quarters while the expeditionary forces were settled at Mersa Gawasis. Given the quantity of rope in cave five, that cave was likely used solely as a storage facility. Food storage appears to have occurred in cave two where large quantities of emmer wheat hulls and barley seeds were found.¹⁴⁰ Given that caves one and eight are significantly smaller than the other six galleries, they would not have been able to hold as many objects or provide as much space for a workshop; cave one contained the salt-encrusted jars, as well as a bead, a conch shell, and a bowl. Perhaps the bead, bowl, and shell were personal effects from a member of an expedition who brought the jars into the cave. Cave eight contained two fire-pits as well as thousands of charred seeds,¹⁴¹ a location that could have been used for cooking and eating. The bread mold from cave four, furthermore, along with the quantities of fish bones, charcoal and hearths, seeds and leaves support the possibility that these galleries were not solely for storage and work, but also areas of habitation and eating. Hearths were prominent in all the galleries and would have provided heat not only for working areas, but also for general warmth and cooking. In cave three, the small mammal bones and hearths were near the entrance, evidence which seems to point to another area where consumption could have taken place. With the hearths at the front, smoke from the fires would be able to ventilate through the entrance rather than building up in the back of the gallery.

COMPARISON OF THE SITES

Wadi el-Jarf, the largest and earliest of the three ports, is over 2,400 hectares in size (based on a rough area of six kilometers by four kilometers) excluding the artificial anchorage

¹⁴⁰ Fattovich 2012: 9.

¹⁴¹ Fattovich 2012: 9.

zone of the jetty that is 2.5 hectares alone. Mersa Gawasis is the second largest, covering an area of almost 21 hectares based on its rough area of 650 meters by 320 meters. Ayn Soukhna is the smallest in area, approximately 15 hectares in size based on its approximate size of 500 meters by 300 meters. Appropriately, Wadi el-Jarf, over 100 times the area of both Ayn Soukhna and Mersa/Wadi Gawasis, also has almost 30 galleries compared to Ayn Soukhna's nine galleries and Mersa/Wadi Gawasis' eight galleries. All three sites have a source of fresh water that would have been a necessity regardless of whether the site was for a temporary or for a more permanent occupation.

Galleries

Man-made galleries, designated as either “caves” (Mersa Gawasis) or “installations” (Ayn Soukhna and Wadi el-Jarf), are found at all three port sites. Six galleries at Mersa Gawasis, averaging 20-25 meters in length,¹⁴² are close in dimension to the galleries at Wadi el-Jarf and Ayn Soukhna. The galleries at Wadi el-Jarf average 20 meters in length, three meters wide, and two meters high – about the same length of the Wadi Gawasis galleries but slightly taller – with gallery G3 running over 30 meters in length.¹⁴³ The Ayn Soukhna galleries are also rectilinear in shape, measuring 2.5 meters wide, two meters high, and 15-20 meters long.¹⁴⁴ The galleries are typically grouped together as a unit to form a storage area (or as is the case at Wadi el-Jarf, two storage areas) where the galleries are approached by wooden ramps leading up to the entrances, where materials involved in maritime expeditions, storage, and habitation are found.

According to Fattovich and Bard, caves two, three, and four were an extension of an already existing natural rock shelter and caves five and six were carved directly into the rock

¹⁴² Fattovich & Bard 2007.

¹⁴³ Tallet, Marouard, & Laisney 2012.

¹⁴⁴ Abd el-Raziq, Castel, Tallet, & Marouard 2012.

terrace from a proximal entryway. Cave six and cave seven were deemed too unstable for human inspection, so they were subjected to a robotic inspection that revealed a lack of artifacts.¹⁴⁵ The only exceptions were the timbers outside of the cave that likely acted as a ramp in ancient times¹⁴⁶ and fragments of copper and textiles, the latter seemingly of linen/flax.¹⁴⁷ At all three harbor sites there is the presence of recycled wood used for ramps outside of the galleries.

Despite the quantity of galleries at Wadi el-Jarf, Tallet argues that the galleries were made in only a few phases in relative uniformity based on the homogeneity of the structures and their overall consistent sizing;¹⁴⁸ Tallet remarks, furthermore, that the galleries only intersect twice. At Mersa Gawasis, however, the group of six galleries has adjoining walls on at least three occasions (fig. 15). While cave seven is not explicitly labeled on the map, the excavation units in front of cave seven are mentioned in the reports and suggest the cave's proximate location to cave six. Cave five connects in the back of the installation to cave two, which connects to cave three. Caves two, three, and four share a large entryway from the original rock shelter, and cave three connects near its front to cave four. Were the openings within the walls that connected these galleries intentional or accidental? If the Egyptians had created these connections to facilitate easier movement throughout the galleries, one might expect the entries between galleries to be more uniform and roughly in the same region of each cave to allow for easier passage between the galleries. Possibly, the openings between the galleries were accidental, created when the galleries were initially carved out, suggesting a sloppier method of construction than Wadi el-Jarf's, with two intersecting galleries, and Ayn Soukhna's, which lacks intersecting galleries altogether. At Wadi el-Jarf, furthermore, the galleries have evidence of a

¹⁴⁵ Fattovich, Bard, & Ward 2011.

¹⁴⁶ Fattovich, Bard, & Ward 2011.

¹⁴⁷ Bard & Fattovich 2009.

¹⁴⁸ Tallet, Marouard, & Laisney 2012.

coating of yellow straw and a white marl applied to the walls and ceilings to help fill natural cracks in the rocks and to help reduce possible water and dust leakage as well as erosion.¹⁴⁹ If the openings in the walls of the galleries at Mersa Gawasis were created by natural collapses or faults in the coral terrace itself after the galleries had already been built and expanded, it would seem all the more relevant to repair and provide support to the walls and roofs of the galleries to prevent further damage, especially if the galleries were only occupied for short periods of time between long periods of abandonment between expeditions using the site. Cave four has two divisions (designated cave four-a/b by the excavators) that could be a natural division in the rock bed. The mapping of five of the Mersa Gawasis galleries (fig. 15) shows the significantly greater quantity of debris found within the galleries compared to the galleries at Ayn Soukhna (fig. 8) and Wadi el-Jarf.¹⁵⁰ Given the lack of permanent architectural remains, Fattovich argues that Mersa Gawasis was not used as a base for seafaring expeditions.¹⁵¹ Galleries that were structurally sound and could withstand the elements over greater periods of time in between expeditions with need for minimal repairs would be beneficial for long-term storage or short-term habitation. On the other hand, if the Egyptians were occupying Mersa Gawasis for extended periods of time, then the galleries may have been made just well enough to provide makeshift quarters or storage units for short-term stays.

One common element of the installations at all three sites is the location of the installations at the bases of foothills and mountains, areas that are significantly steeper topographically than other parts of the sites. While being far enough away from the shoreline to avoid high tide and potential flooding, the galleries being built into hills would also have the advantage of a more solid sheltered area with a solid rock roof rather than a mud-brick structure

¹⁴⁹ Tallet, Marouard, & Laisney 2012: 404.

¹⁵⁰ See Tallet, Marouard, & Laisney 2012 Fig 10.

¹⁵¹ Fattovich 2012.

exposed to an open desert region.

The galleries at Ayn Soukhna and Wadi el-Jarf have closure systems that were installed in the galleries' entrances. A closure system could suggest that the materials within the galleries were valuable enough that they needed to be protected. Along with protecting valuable materials, the closure system could have also been implemented in order to shelter the stored materials from inclement weather or for the purposes of general preservation. While the presence of a closure system suggest that the harbor sites were temporary or seasonal, it is interesting to note that Mersa Gawasis's galleries do not have a closure system akin to Wadi el-Jarf and Ayn Soukhna. While the galleries may have been intended for storage, the lack of a closure system suggests that either the materials were not as valuable as the materials at the other sites and therefore did not necessarily need an elaborate closure system to protect the materials inside; that the stored materials themselves were not necessarily in danger of being plundered, given the rather desolate region in which Mersa Gawasis is located; or rather, that the entrances were possibly covered with flora or other makeshift materials that simply have not survived.¹⁵²

The overall material assemblage found within the galleries across the three sites was remarkably similar. Given the ubiquitous nature of ceramics at Egyptian sites, it is unsurprising that all three harbor sites' galleries contain many fragments of ceramics, particularly storage jars. At Wadi el-Jarf and Mersa Gawasis, animal bones, and ashy concentrations and hearths were present in the galleries. There are other structures at Ayn Soukhna (such as the Kom 14 structure) that have hearths. Rope fragments (and full-coiled rope bundles at Mersa Gawasis) as well as an abundance of wood fragments were found in the galleries at all three sites. The wood pieces range from fragments of boat construction elements (such as ligatures, tenons, and

¹⁵² I would like to thank Ann Roth for these suggestions.

dowels) to planks and rudder and oar blades. Rope and wood are also expectedly similar finds, given the maritime nature of the sites and the need to store boat-related components. The wooden storage boxes are an interesting find for Mersa Gawasis, given that it is the only site of the three to not have a visible closure system present at the galleries; perhaps, the boxes provided enough protection that a more viable closure system was unnecessary.

The layout of the galleries themselves are also interesting. At all three harbor sites, there are two distinct groupings of galleries (figs. 3, 7, & 14). Apart from the northernmost grouping of galleries at Wadi el-Jarf, the galleries tend to be laid out fairly linearly, an order that coincides with the natural rock formations into which the galleries are carved. The orientation of the larger gallery groups at Ayn Soukhna and Mersa Gawasis galleries are orientated the same, southwest-northeast. This orientation angles the entrances to the galleries towards the shoreline. While Wadi el-Jarf's groups of galleries are similar in number, both Ayn Soukhna and Mersa Gawasis have one group of galleries numbering significantly higher (in both instances, six galleries) than the smaller group (two at Mersa Gawasis, three at Ayn Soukhna). The materials within the larger galleries versus the smaller ones, however, were not diverse enough to warrant that the smaller galleries served a significantly different function than the larger groupings.

OTHER STRUCTURES AT THE PORTS

All three harbor sites contain remains of structures that may have been used for habitation. Wadi el-Jarf has the remains of "light installations" as well as the camping area (zones two, three, and four), and the intermediary building of zone five. In figure three,¹⁵³ the labeling of *installations légères* is also accompanied by what look like depictions of thin walls; in figure

¹⁵³ Tallet, Marouard, & Laisney 2012.

five immediately to the west of the intermediary building, however, there is nothing additional drawn besides the label of *installations légères*. It is unclear as to what “light installations” are referring. Ayn Soukhna has the lean-to structure that fronts four of the galleries, the Kom 14 structure, and metallurgical workshops. The Kom 14 structure, as noted above, appears to have been used for temporary living quarters, based on the archaeological remains of the hearths and facilities that seem to be related to baking and butchering and also had an upper story that may have been used for storage.¹⁵⁴

While Abd el-Raziq et al. comment on the remarkable nature of the boat-shaped pit at Ayn Soukhna, the copper workshops as well as the boat-shaped pit stand out as unique when comparing Ayn Soukhna with the other two harbors. Several boat pits have also been identified at Giza, five of which are boat-shaped and two of which are narrow and rectangular.¹⁵⁵ The rectangular pits contained the disassembled pieces of the Khufu boats.¹⁵⁶ Despite the seemingly symbolic nature of the Giza boats “connected with Khufu’s final earthly voyage” to the Great Pyramid found in the two southern pits,¹⁵⁷ the boat pit at Ayn Soukhna seems to emphasize the practicality of the pit functioning as an assembling and disassembling site for boats used for expeditions to the Sinai.¹⁵⁸ Wadi el-Jarf, while also a site presumably used for mining expeditions, does not appear to have copper workshops of its own. Ayn Soukhna seems to have been not only a site where mining expeditions were dispatched but also a site to which they returned and worked the raw materials obtained. Because Mersa Gawasis was presumably not involved in mining expeditions due to the site’s distance from the Sinai, metal workshops would not be

¹⁵⁴ Abd el-Raziq, Castel, Tallet, & Marouard 2012. The authors do not elaborate further on specifics regarding these facilities.

¹⁵⁵ Lehner 1997.

¹⁵⁶ Lehner 1997.

¹⁵⁷ Lehner 1997: 119.

¹⁵⁸ Abd el-Raziq, Castel, Tallet, & Marouard 2012.

expected there.

North of the zone one galleries at Wadi el-Jarf there appear to be three separate areas of camp sites (zones two, three and four), all of which are in regions of greater elevation than the rest of the site and run north-south, parallel to the western side of a large trail (fig. 4). Tallet et al. suggest that the elevated location of the facilities in zones two through four could provide a vantage point to observe both the galleries and the shoreline.¹⁵⁹ Despite being a fair distance from the coastline, the location of the remnants of light structures at Mersa Gawasis at the top of the western coral terrace would also be beneficial as a vantage point to observe the coastline as well as the caves. The encampment site of zone two at Wadi el-Jarf has more architectural remains compared to zones three and four, and seems to have had a surrounding wall as well as two large deposits of ashy waste as well as burnt pottery sherds located at the southern end.¹⁶⁰ An access pathway allows for entry to the zone two camps on the eastern side where the elevation from the main trail is less steep. Zone three, like zone two, also has a large deposit at its southern end. These three zones have two phases present, both phases dating to the early Old Kingdom based on the ceramics that also date to the early Old Kingdom.¹⁶¹

Comparisons with Giza

Zone five at Wadi el-Jarf consists of an unexcavated structure, an intermediary building (*bâtiment intermédiaire*) located southeast of the galleries and camping zones (fig. 5). The building is approximately 55 meters by 30 meters and consists of a series of long rectangular units that are divided into smaller rooms by walls; the walls of the structure are uniform and

¹⁵⁹ Tallet, Marouard, & Laisney 2012.

¹⁶⁰ Tallet 2012b; Tallet, Marouard, & Laisney 2012. According to Marouard (2012) the zone 2 structure's "rectangular constructions organized into cell-like rooms" served as dwelling places.

¹⁶¹ Tallet, Marouard, & Laisney 2012.

roughly one meter thick. The plan drawing shows a faint presence of what is labeled a fortification wall on the southern side of the structure; this wall, however, seems to simply be the remains of an enclosure wall, given that its general thickness is similar to the rest of the structure's own walls. This intermediary building structure somewhat resembles the gallery sets at Giza South, Lehner's Area A (fig. 16). While the term gallery is used to describe the storage installations at the harbor sites, the Giza galleries seem to have been more multifaceted, given that there are also a series of linearly arranged galleries that seemed to have served a storage-oriented function as well as used for a "variety of crafts, particularly sculpting and stone-working" in Area C, rather than serving as actual living quarters, despite Petrie's labeling of "Workmen's Barracks."¹⁶² The galleries at Giza are grouped into sets of long rectangular units that are also divided into smaller units by walls, similar to the Wadi el-Jarf intermediary building (fig. 5).

The Giza gallery complex is delimited by an enclosure wall running along the western and southern edges of the area and a large stone wall, the Wall of the Crow, to the north. Regarding the Giza gallery complexes in general, they typically have archaeological remains of colonnades to support roofing structures. While colonnades were not present in every gallery, a partition near the opening was also usually present. In several of the galleries there were low benches, and an oven or hearth feature was in the front of one gallery. Lehner notes that the walls of the Area A Giza gallery sets are unusually thick, as mud-brick walls that are significantly thinner are known to have supported multiple stories of other structures.¹⁶³

As mentioned above, the Wadi el-Jarf zone five structure, 55 meters by 30 meters in size, has walls that are uniform in thickness that are approximately one meter thick, and is comprised

¹⁶² Conrad & Lehner 2001: 60.

¹⁶³ Lehner 2002: 37, 50.

of 13, three by 24-meter north-south-oriented rectangular units that have smaller room-like subdivisions (fig. 5). The Area A gallery sets, based on the dimensions of a fairly well-preserved gallery in set III, have exterior walls that are almost two meters thick and galleries measuring nearly five by 35 meters. Lehner also discusses how the southern ends of the Giza gallery sets have room structures that resemble houses and feature ash residue in the rear part, possibly to signify an area of cooking or baking. Lehner suggests that the Giza galleries were also used for sleeping based on the presence of platforms, and one 21.5-meter-long gallery front, for example, could have provided enough sleeping space for an estimated 40 to 50 people.¹⁶⁴ The Ayn Soukhna galleries are also roughly contemporary with the Giza galleries. The Ayn Soukhna galleries are also rectilinear, but measure 15 to 20 meters long, 2.5 meters wide, and two meters high, much shorter and narrower than the Giza A galleries.¹⁶⁵

Because the zone five structure at Wadi el-Jarf has not been excavated, no comparisons at this time can yet be drawn between archaeological remains (surface ceramics excluded) that may be present; it would be interesting to see, however, whether any similarities between this structure and the Giza gallery complex, a contemporaneous site that has at least a similar floor plan, would occur and could shed light on the function of the Wadi el-Jarf building, or at least draw parallels between its function and that of the Giza galleries. The intermediary building of zone five at Wadi el-Jarf has 13 long units that are approximately 24 meters in length, but only three meters wide compared to the Giza galleries' widths of five meters.

The Area A galleries at Giza are much larger in area than the intermediary building of Wadi el-Jarf's zone five, but the population of workers at Giza was likely significantly greater than the expeditionary force that went to the Red Sea coast and would therefore correspond to

¹⁶⁴ Lehner 2002: 70.

¹⁶⁵ Abd el-Raziq, Castel, Tallet, & Marouard 2012.

the larger facilities. The camping area in zone two at Wadi el-Jarf also seems to be comprised of similar elongated rectangular units, albeit a bit more spread out and separated. There is also the presence of an enclosure wall along the northern side which probably ran around the perimeter of the camping area. Besides the higher-elevated location of the camping area, the wall could also have served as a defense for the occupants of the living quarters. At Giza, the archaeological remains and stratigraphy suggest an abandonment of the Area A galleries at the end of the 4th dynasty¹⁶⁶; Wadi el-Jarf also seems to have been abandoned at the end of the 4th dynasty.¹⁶⁷ Because the zone five structure at Wadi el-Jarf has not been excavated, no comparisons at this time can yet be drawn between archaeological remains (surface ceramics excluded) that may be present; it would be interesting to see, however, whether any similarities between this structure and the Giza gallery complex, a contemporaneous site that has at least a similar floor plan, would occur and could shed light on the function of the Wadi el-Jarf building, or at least draw parallels between its function and that of the Giza galleries.

At Giza, furthermore, there is a set of galleries west of the Khafre pyramid, Lehner's Area C, which Petrie excavated and labeled "Workmen's Barracks" (fig. 16).¹⁶⁸ There are an estimated 111 comb-like galleries,¹⁶⁹ covering an area 450 meters by 80 meters, and contained remnants of ash, pottery, bone, and other refuse,¹⁷⁰ all typical materials found within the harbor sites' rock-cut galleries. The Giza Area C galleries' dimensions average 2.5 to 3.0 meters in width,¹⁷¹ the same average widths as the Wadi el-Jarf zone one galleries and Ayn Soukhna galleries. Based on the map of the galleries, the galleries seem to be uniform in length; one Giza gallery in Area C that

¹⁶⁶ Lehner 2002.

¹⁶⁷ Tallet, Marouard, & Laisney 2012.

¹⁶⁸ Conrad & Lehner 2001.

¹⁶⁹ Conrad & Lehner 2001: Petrie identified 91 galleries. Lehner's estimates potentially 111 galleries.

¹⁷⁰ Conrad & Lehner 2001.

¹⁷¹ Conrad & Lehner 2001.

was excavated entirely, gallery 35, measured 28.5 meters long,¹⁷² almost ten meters longer than the average length of the Wadi el-Jarf and Ayn Soukhna galleries, but only five to ten meters longer than the Mersa Gawasis installations.¹⁷³ This Area C 36,000 square meter area is over ten times larger than the approximate square meter area of the zone two encampment at Wadi el-Jarf, the latter which spans approximately 50 by 65 meters in area,¹⁷⁴ and contains over three and a half times the number of galleries than Wadi el-Jarf, the latter which is already ten times the area and three times the number of galleries as Ayn Soukhna and Mersa Gawasis. Although Petrie believed that the Giza Area C galleries were barracks, Lehner suggests that the galleries may have had a “settlement quality” near the entryways,¹⁷⁵ but were areas of craft-working and baking based on the number of bread molds (pointing to food production and possibly consumption), the lack of internal walls or obvious hearths, and that the galleries were initially planned as storage facilities. Lehner comes to the same conclusion regarding the location of this group of galleries that Tallet does with the zones two, three, and four encampment areas – a higher elevation would have provided “a form of security and control for food, precious materials, and the finer craft industries,”¹⁷⁶ as well as being a safe distance from the flood plain.

Buildings for Industry or Habitation?

At Wadi el-Jarf, the intermediary building as well as the zone two camping area alone could house a substantial number of individuals (not even including the smaller camping zones

¹⁷² Conrad & Lehner 2001.

¹⁷³ Wadi el-Jarf, however, does have a few outliers that are over 30 meters in length (Gallery G3). The Mersa Gawasis caves average 20-25 meters in length, excluding Caves 1 and 8, which seem to be more akin to rooms rather than lengthy installations.

¹⁷⁴ These approximate dimensions are based on the scaled map drawing from Tallet, Marouard, & Laisney 2012 figure 6 *Plan general des camps (zones 2-4)*.

¹⁷⁵ Conrad & Lehner 2001; 47. The authors note the presence of ash containing carbonized plant refuse, that may suggest nearby hearths, as well as the presence of animal bones and pottery, but believe that the overall use of the galleries were more industrial and storage-like.

¹⁷⁶ Conrad & Lehner 2001; 60.

three and four where significantly less architectural features remain), albeit probably in close quarters. On the other hand, if the zone five structure were for industrial purposes, rather than living quarters, three encampment areas in an elevated location would likely be sufficient living quarters. At Ayn Soukhna, the industrial areas – the metallurgical workshops – are also nearer to the coastline; although there is the Kom 14 sector which has archaeological remains that suggest living quarters, there are also remnants of baking and butchering facilities, storage use, and traces of copper processing,¹⁷⁷ overall an area of industry. Across the three sites, all craft/work areas are closer to the coast where the terrain is relatively flat before the rise of natural cliffs where all the galleries are located. Because the galleries were used for storage, storage that could have been necessary for great lengths of time, it would be beneficial to have them located further from the coast and potential flooding. Given the number of encampment sites that are at a higher elevation and a greater distance from the shoreline (zones two, three and four), the zone five building may not have been a housing unit.

At Mersa Gawasis there has been no evidence of permanent architecture found, but remains within the galleries suggest living quarters within the galleries themselves and a more temporary occupation of the site overall. The site was intended for a different purpose than Wadi el-Jarf and Ayn Soukhna. From the inscriptional evidence found there, Mersa Gawasis was clearly a departure point on the Red Sea from which Egyptians would sail to the land of Punt to obtain exotic products such as incense, ebony, ivory, and wild animals such as monkeys and baboons¹⁷⁸ before returning to the Nile Valley and subsequently to pharaoh. The expeditionary force probably would not need to stay at Mersa Gawasis for long periods of time – long enough to assemble and disassemble boats, leave materials in the galleries, and rest - before trekking back

¹⁷⁷ Abd el-Raziq, Castel, Tallet, & Marouard 2012.

¹⁷⁸ Shaw 2000.

through the eastern desert and returning to the Nile Valley with the products.

TO PUNT: A LONG TRADING VOYAGE

Mersa Gawasis, unlike Wadi el-Jarf and Ayn Soukhna, was not a harbor intended for use as a departure point north to the Sinai for copper and turquoise, but rather as a departure point south to the land of Punt. The location of Punt, whether it was in Africa or the Arabian Peninsula has been widely debated,¹⁷⁹ although a location of Africa is now generally the consensus, and the question is the extent of the area so designated.

There are scenes of Punt from the Old Kingdom mortuary complex of Sahure,¹⁸⁰ but the best-represented images of this exotic land are from the mortuary complex of Hatshepsut at Deir el-Bahari from the New Kingdom¹⁸¹ (fig. 17) where the exotic products are clearly represented, particularly the incense trees being taken back from Punt to Egypt to be planted in the gardens of Amun, the terraces of Hatshepsut's temple at Deir el-Bahari. A late Egyptian text mentions that rain fell on the mountains of Punt that then flowed down into the Nile "so that a good flood went north into Egypt."¹⁸² Kitchen suggests that these mountains are the Ethiopian highlands, rain that would have runoff into Lake Tana, the Blue Nile and Atbara rivers, rivers which flow into the Nile; Kitchen notes this text (which he does not reference more specifically) because placing Punt in southern Arabia – or exclusively Somalia – would not make sense since the rain from the mountains would have to somehow cross the Red Sea or "down, into, across, and up out of the Dire Dawa depression...and then in either case 'climb' ...over the Ethiopian massif."¹⁸³ While the

¹⁷⁹ For example, Bradbury 1996; Fattovich 1991; Harvey 2003; Herzog 1968; Kitchen 1971, 1993, 1999, 2007, 2012; and Meeks 2003.

¹⁸⁰ Borschardt 1913 and el-Awady 2009 both have line-drawings of Sahure's reliefs.

¹⁸¹ Kitchen 1993 based on Naville 1898 vol. 3.

¹⁸² Kitchen 2012; 59.

¹⁸³ Kitchen 2012; 59.

extent of the land of Punt is still unknown, the land of Punt was an important trading partner with Egypt, and according to the texts found there, the port of Mersa Gawasis was used as a departure point on the way to Punt.

The earliest account of an Egyptian expedition to Punt is in the Palermo Stone under the reign of Sahure,¹⁸⁴ with subsequent expeditions carried out throughout the Old, Middle, and New Kingdom.¹⁸⁵ An expeditionary leader named Harkhuf led four expeditions to Nubia, and his tomb biography at Aswan recorded that he brought back a pygmy from Nubia, a pygmy that one of the two kings Harkhuf served, Neferkare-Pepi II, desired “to see this pygmy more than the gifts of the mine-land and of Punt.”¹⁸⁶ Harkhuf is also recorded as having brought back incense and ebony, animal skins and ivory,¹⁸⁷ all luxury products that are typical of journeys to Punt. In the Middle Kingdom under the reigns of Mentuhotep III, Senwosret I, and Amenemhat II, there are textual references to Punt and what is believed to be the Red Sea.¹⁸⁸ The high official Henu under Mentuhotep III left a rock-inscription in the Wadi Hammamat that discusses how the expeditionary force took their supplies for ship assemblage to the coast, corroborating the notion of forces moving through the eastern desert to the Red Sea before departing for Punt.¹⁸⁹ The port of Saww is named under Senwosret I, as well as the triple stela of anchors set up by the Chamberlain Ankhaw (at Mersa Gawasis) and a stela dating to the reign of Amenemhat II mentioning a voyage to Punt under the Sealbearer Khentekhety-wer, also at Mersa Gawasis,¹⁹⁰ both discussed above. It is worthwhile to mention the New Kingdom references briefly, since Mersa Gawasis functioned as a harbor into the New Kingdom as well. Besides the expedition to

¹⁸⁴ Wilkinson 2000.

¹⁸⁵ Kitchen 1971.

¹⁸⁶ Lichtheim 1973: 27.

¹⁸⁷ Lichtheim 1973.

¹⁸⁸ Kitchen 1993.

¹⁸⁹ Kitchen 1971.

¹⁹⁰ Sayed 1977.

Punt by Hatshepsut, there are expeditions to Punt also mentioned in private tomb-chapels of high officials dating to Thutmose III to Amenhotep III as well as two records in the Karnak Annals under Thutmose III.¹⁹¹ There are some allusions to Punt under the later part of the 18th dynasty, and an expedition described in the Harris Papyrus under Ramesses III.¹⁹²

Whether Punt ultimately was in Africa or on the Arabian Peninsula, the Egyptians would have had to travel on the Red Sea either way to get to their final destination. The Red Sea is subject to two sets of different seasonal winds; while the southern portion is affected by the monsoon winds and rains from the Indian Ocean where it would be easy to sail south at the end of the monsoon season, the northern half of the Red Sea is affected by a prevailing wind that blows north year-round (figs. 18-21).^{193,194} While traveling north in the northern half of the Red Sea could be difficult, Facey explains that smaller vessels could sail north by taking advantage of off- and on-shore breezes by hugging the coast, rather than venturing out into open water. Kitchen also suggests a similar sailing method for the Egyptians and marks out in his gazetteer all the possible inlets in which the Egyptians could stay overnight in between sailing all day.¹⁹⁵

The Punt reliefs from Deir el-Bahari, furthermore, feature five large ships. Was this a typical number of vessels used for this voyage? How many ships would have been required to carry back the luxury products from Punt? In the Punt reliefs on the middle colonnade on the southern wall at Deir el-Bahari, five ships – two of which already moored with sails slack and

¹⁹¹ Kitchen 1993.

¹⁹² Kitchen 1993.

¹⁹³ Facey 2004.

¹⁹⁴ Murray 1987: Based on a comparative study of ancient wind patterns recorded by Aristotle and Theophrastos in the Mediterranean and modern winds, 82% of the time the modern and ancient winds still follow the same patterns. It can be assumed that the Red Sea winds and currents likely still follow similar enough patterns and directions that they did in ancient times as well.

¹⁹⁵ Kitchen 1971. Also, Kitchen 2007, which includes an expanded gazetteer involving possible landing-places for ancient shipping extending down to Somalia's northeastern coast and another gazetteer for the Arabian coast. Kitchen suggests about 130 possible inlets and coves for harboring boats on the west/African coast, whereas only 50-60 for the eastern/Arabian coast.

three with sails still unfurled – are pictured. In Naville’s plate LXIII,¹⁹⁶ the foremost ship can be seen in entirety and depicts 23 men, 15 of which are rowers (fig. 17). Even if the number of rowers is doubled (to account for both sides of the ship), that would still only account for a total of 38 men on one vessel. Even if rounded up to 40 men, these five large vessels that had journeyed to Punt would have carried only 200 men, a fraction of the number of men that supposedly went on the mining expeditions up in the Sinai.¹⁹⁷ In the famous Middle Kingdom story, the wrecked ship in the *Tale of the Shipwrecked Sailor* measured 120 cubits in length, approximately 63 m long.¹⁹⁸ This is an extraordinary length, however, compared to the known found boats such as those at Abydos, Giza, Ayn Soukhna, and Dahshur, as well as estimated ship lengths based on found ship components at Mersa Gawasis. Ward estimates that vessels sailing for Punt could have been at least 20 to 30 meters long based on the length of rudder blades found at Mersa Gawasis.¹⁹⁹ Ward and a team of 24 members then designed an Egyptian ship that measured 20 by 4.89 by 1.7 meters.²⁰⁰ The experimental ship, *Min of the Desert*, could have its sails raised by 16 members while six members rowed, and with the assistance of the wind, as few as two members could turn the ship around.²⁰¹ The four Dahshur boats all have hulls that average about ten meters in length²⁰² and the Abydos boat graves near the enclosure of Khasekhemwy that contain actual wooden boats, average a little over 28 meters in length.²⁰³

At Ayn Soukhna, the burnt wood remains only would have made up two boats that were stored in the galleries. Pomey estimates the burnt boats to have been at least 13.5 meters in length, shorter than the Punt vessels, yet again, the mining expeditions supposedly had several

¹⁹⁶ Naville 1898 vol.3

¹⁹⁷ Kitchen (2012) also makes an estimate of 15 oarsmen with an additional seven to eight men per vessel.

¹⁹⁸ Simpson 2003: 48. Simpson gives the conversion of one cubit = 20.6 in or .523 m.

¹⁹⁹ Ward 2012: 222.

²⁰⁰ Ward 2012: 224.

²⁰¹ Ward 2012: 224.

²⁰² Patch & Haldane 1990: 29.

²⁰³ O’Connor 2009: 186.

thousand men. Just because only two boats seemed to have been left at the site, however, does not mean that other boats were not also in use. Other boats could have been involved in mining expeditions but were simply not left at the site when Ayn Soukhna was abandoned. On the shrine-stela of Ankow from Mersa Gawasis, one of the jambs of the shrine has hieroglyphs signifying the number 400 concerning the number of troops and officials on this expedition, but given the fragmentary state of the stela the number may in fact be higher. Rock-inscriptions at Ayn Soukhna give numbers of soldiers at 3000 and 4000. Are the numbers of members that are stated in the inscriptions from Ayn Soukhna and Mersa Gawasis realistic figures or exaggerated? And if the numbers are realistic, then how many members were involved any expeditions out of Wadi el-Jarf where the site is over 100 times greater in area than the other two sites? The goods being obtained from Punt were no mere everyday items, but commodities that would have been enjoyed only by the elite. The expeditions were likely large government-financed enterprises and the journey would likely not have been made as frequently as expeditions to the Sinai.

Ayn Soukhna and Wadi el-Jarf as Departure Points?

Despite clearly being launching points for mining expeditions into the Sinai, would Wadi el-Jarf or Ayn Soukhna have been feasible locations to launch expeditions southward to the land of Punt? At Ayn Soukhna, there is epigraphic material dating to the reigns of two pharaohs who are also known to have carried out expeditions to Punt: Djedkare and Senwosret I. By the 12th dynasty, however, Mersa Gawasis was already a well-established harbor site, and the use of Ayn Soukhna as also a potential location to launch an expedition to Punt would seem unlikely. One rock-face inscription dating to Mentuhotep IV at Ayn Soukhna records a mining expedition

during the *šmw* season,²⁰⁴ a season which ran from late February to late June.²⁰⁵ Was the *šmw* season typical for mining expeditions? Based on the winds, currents, and tides of the Red Sea, it would be advantageous to sail north during winter months (November to March) when the currents would also be flowing north during most of the *šmw* season, and it would also seem advantageous to sail in a season opposite of a journey to Punt so that resources, such as boats and other equipment, could be reused. The burnt remains at Ayn Soukhna in galleries G2 and G9, furthermore, seemed to make up only two boats. Were only two boats typically sent on expeditions to the Sinai? Two boats would not seem sufficient for an expedition to Punt if the Deir el-Bahari reliefs are any indication of the size of an expeditionary force for Punt, the site of Ayn Soukhna is only marginally larger than Mersa Gawasis. Again, however, more boats could have been in use at Ayn Soukhna, but the remains either have not survived to present day or are simply located elsewhere.

Wadi el-Jarf has three times the number of galleries than Ayn Soukhna, and at least three of the excavated galleries contained numerous fragments of wood. Could Wadi el-Jarf have been a feasible departure point for Punt expeditions? While located farther south than Ayn Soukhna, traveling south to Punt would still have been a lengthy voyage from Wadi el-Jarf. Wadi el-Jarf could have been a departure point to Punt for any expeditions undertaken in the Old Kingdom before Mersa Gawasis was established and developed into a larger, more frequently used site, but the presence of Old Kingdom material at Mersa Gawasis already suggests the site was in use; given the infrequency of Punt expeditions, furthermore, it would seem unnecessary to have two sites from which to launch such expeditions. It would be interesting to see during future excavations at Wadi el-Jarf if any Old Kingdom papyri that may allude to a Punt journey is

²⁰⁴ Abd el-Raziq. 1999: 128.

²⁰⁵ Wenke 2009: 53-56.

uncovered and pushes back the first textual evidence of a Punt voyage (Sahure, 5th dynasty) to an even earlier date and dynasty.

Other Ports of Call on a Voyage to Punt?

Besides Wadi el-Jarf, Ayn Soukhna, and Mersa Gawasis, could there be other early pharaonic harbors along the Red Sea coast? Given that Wadi el-Jarf and Ayn Soukhna are both farther north and within the Gulf of Suez, would it be reasonable to have a second harbor, possibly closer to Mersa Gawasis, somewhere in between the Gulf area and Mersa Gawasis, or even farther south than Mersa Gawasis? Could there be at least one other harbor like Mersa Gawasis with no permanent architecture to have somewhere to stop off rather than just an inlet, especially if Punt were further down the coast nearer the Horn of Africa? Kitchen says that after Dungunab Bay/Muhammed Qol, his inlet number 57/58, “permanent settlement is feasible from here southwards.”²⁰⁶ Mersa Gawasis to Ras Kasar (on the border of Sudan and Eritrea) is just shy of 1,117 kilometers, which would take around 23 days to reach.²⁰⁷ Kitchen extends his original 1971 gazetteer to include the Horn of Africa, an additional 1,957 kilometers,²⁰⁸ which would take another 41 days if Punt were located even farther south nearer Somalia. A trip to Punt, were it to extend that far south, could take up to two months one way if traveling with favorable currents and winds. A hypothetical harbor stop along the coastline could be reached via boat travel rather than through a wadi (although this seems unlikely, simply based on inconvenience and likely an inability to properly maintain and monitor a site that would be so out of the way).

²⁰⁶ Kitchen 1971; 200, n. 122.

²⁰⁷ Kitchen 2007; Kitchen estimates about 694 miles from Mersa Gawasis to Ras Kasar. Kitchen (1971) assumes a sailing speed of 3 knots, travel approximately eight to nine hours a day, averaging 30 miles (roughly 48 kilometers) a day.

²⁰⁸ Kitchen 2007. From Ras Kasar to Hafun/Opone, 819.5 miles were calculated based on adding the distances Kitchen lists in his zones V, VI, and VII.

Wadi el-Jarf was abandoned at the end of the 4th dynasty, and plausibly the Egyptians moved north to Ayn Soukhna, which has ceramics dating to the later Old Kingdom. Wadi el-Jarf was a complex site that not only undertook expeditions to the Sinai for copper and turquoise, but had the storage capacity to undertake other activities (possibly journey to Punt?), given its enormous size compared to Ayn Soukhna and Mersa Gawasis; yet, until more of the architectural structures (such as the zone five building) can be further excavated, the extent of the complexity of this site is unknown.

The shift from Wadi el-Jarf to Ayn Soukhna may have been to use Ayn Soukhna primarily for mining expeditions, given the presence of several metallurgical workshops. Not only is Ayn Soukhna the only site of the three harbors with an enclosed structure around several of the galleries, but also the only one with metallurgical workshops. Despite Mersa Gawasis's lack of permanent architecture, it has the longest running occupation, dating from the Old Kingdom through the New Kingdom.²⁰⁹ Mersa Gawasis, furthermore, has a water source from the wadi as well as local sources of clay, all likely strong factors when determining the location of the harbor.²¹⁰ Did the seemingly intermittent use of Mersa Gawasis contribute to its longevity? Because there was no permanent architecture besides the galleries, very little of the site would have needed maintenance or permanent inhabitants. Perhaps Mersa Gawasis' location farther south within the Eastern Desert, along with being situated on a well-sheltered closed bay, yet in a region where there was a lack of fresh water,²¹¹ contributed to natural protection and at the same time contributed to the lack of permanent residences. Mersa Gawasis, however, could have been established around the same time as Ayn Soukhna specifically for Punt expeditions. Given

²⁰⁹ Fattovich & Bard 2007; 241-242. Mersa Gawasis has ceramics and stratigraphic sequences dating to Old Kingdom (6th dynasty), Middle Kingdom, and New Kingdom use.

²¹⁰ Fattovich & Bard 2007: 107.

²¹¹ Fattovich & Bard 2007. Presumably a lack of fresh water for the area in general, given that this same source stated that the wadi provided a fresh water source for the site.

the northern location of Ayn Soukhna, it does not seem likely that it was used as a launching point for Punt, but rather solely as a departure point to the Sinai and as a metallurgical workshop.

CONCLUSIONS: DEFINING AN EARLY EGYPTIAN HARBOR

What features, then, are characteristic of an early pharaonic harbor? There clearly needs to be some sort of storage facility – in these three cases, galleries or caves that were present at all the sites – to hold disassembled boats stored between expeditions, rope, spare parts, and other maritime elements, as well as storage jars, food supplies, and any other materials the Egyptians would have needed, especially if they were staying at the site for a lengthy period or returning to the site regularly. The storage installations, rock-cut galleries from the natural terraces that already existed at the harbors, are all located further from the coastline than other structures, likely to avoid flooding from high tide. Along with galleries, all three sites' areas of habitation are at elevations that would provide a vantage point to be able to observe both the galleries as well as the coastline and other industrial areas. Despite the lack of permanent architecture at Mersa Gawasis, there are still remnants from temporary camping areas, and at Wadi el-Jarf there are “light installations.” Ayn Soukhna, as mentioned before, has the presence of the boat-pit as well as the metal workshops, features unique to this site compared to the other two harbors, and Wadi el-Jarf has the jetty that extends into the Red Sea, a feature unique to that site. At a harbor, there would presumably need to be a docking point at which to anchor incoming and outgoing ships. At Wadi el-Jarf, the jetty creates a location for this.

Besides storage, the Egyptians would have needed areas for food production as well as industrial practices. All three sites have areas associated with industry, such as Ayn Soukhna's Kom 14 structure and metal workshops, possibly Wadi el-Jarf's zone five structure, and the harbor area at Mersa Gawasis, that are located closer to the shoreline than the galleries and living

quarters. The Kom 14 structure and the harbor area also have archaeological remains that suggest habitation. Hearths and kilns are also present at all three sites, as well as evidence of local ceramic production. Based on these three early pharaonic harbors, permanent architecture is a factor for sites involved in mining expeditions (and whatever else may have occurred at Wadi el-Jarf), but not necessarily for intermittent journeys to Punt.

Mining and Punt expeditions would have had different needs, and the sites' architectural features reflect these differences. Despite both types of expeditions being governmental enterprises, trips to the Sinai were undertaken more frequently than those to Punt, and the distance from Ayn Soukhna and Wadi el-Jarf to the Sinai was significantly shorter than a journey south from Mersa Gawasis to Punt. The products obtained from each expedition were also different. In the Sinai, copper and turquoise were the main material objectives of the expeditions compared to the luxury goods from Punt. Turquoise was used extensively in jewelry, and along with metallurgy, copper was also used in medicines, pigments, and in glazes and glass.²¹² These goods were likely available to a larger percentage of the population than the commodities obtained from Punt.

Even though all three sites are harbors/ports, Wadi el-Jarf and Ayn Soukhna clearly served a more complex purpose than simply acting as a docking point for maritime expeditions. Metalwork was clearly undertaken at Ayn Soukhna, and Wadi el-Jarf's massive zone five structure provides space for a large enterprise, if it was used as a workshop of some kind. Wadi el-Jarf's massive size in general likely allowed for multiple work forces (e.g. quarrying, mining, pottery production) to be active simultaneously at a given time. Mersa Gawasis, on the other hand, appears to be a harbor that functioned mainly as a maritime site. Even at this

²¹² Aston, Harrell, & Shaw (chapter 2); and Ogden (chapter 6) in Nicholson, P.T. & Shaw, I. 2000. *Ancient Egyptian materials and technology*. Cambridge University Press.

intermittently-inhabited site, there were areas of lithic industry and food production.²¹³ It will be interesting to see what more, if any, maritime-related archaeological remains turn up at either Wadi el-Jarf or Ayn Soukhna, particularly relating to maritime expeditions that may have occurred from these two harbor sites.

²¹³ Fattovich 2012.

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²¹⁴ Figures 1, 13, 14, and 16 are my own and based on images from publications. Figures 2-6 are from Tallet, Marouard, & Laisney 2012. Figures 7,8, 10-12 are from Abd el-Raziq, Castel, Tallet, & Marouard 2012. Figure 9 is from Tallet 2009. Figure 15 is from Fattovich 2012. Figure 17 is from Kitchen 1993. Figures 18-21 are GoogleEarth imagery with Facey 2004 superimposed.

FIGURES



Figure 1: The Pharaonic Harbors of Wadi el-Jarf, Ayn Soukhna, and Mersa Gawasis on the Red Sea coast (overlaid on GoogleEarth imagery)

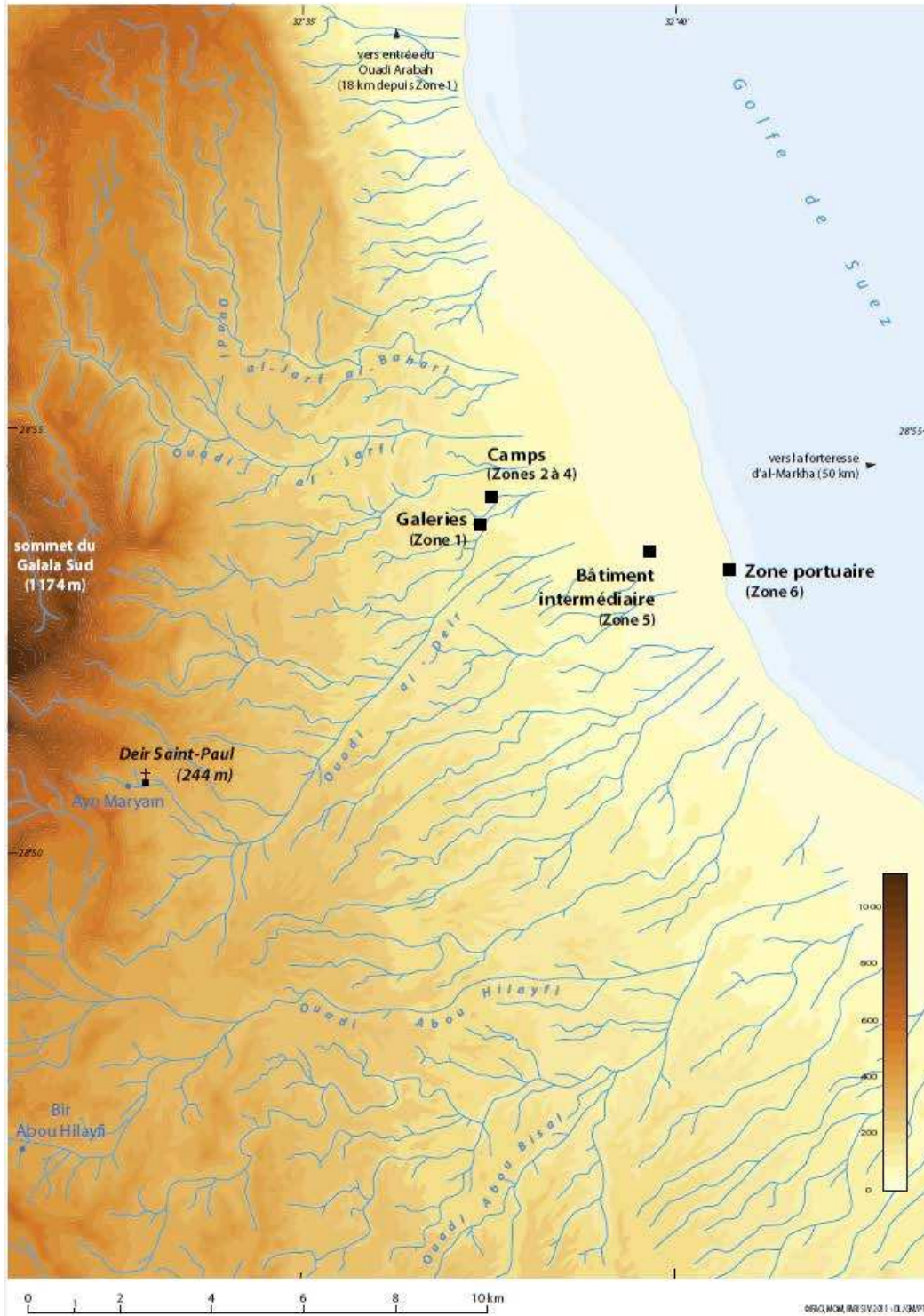


FIG. 2. Carte de la région du Ouedi al-Jarf.

Figure 2: Site map showing distribution of zones at Wadi el-Jarf

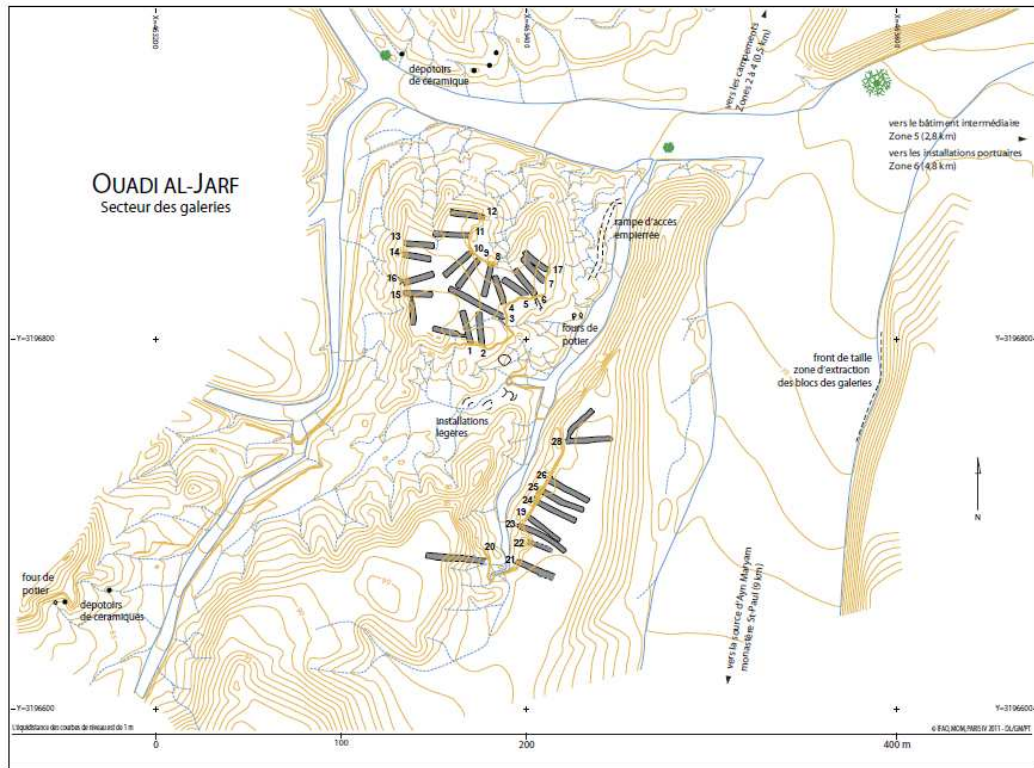


FIG. 3. Plan topographique de la zone des galeries (Zone 1).

Figure 3: Zone 1, Gallery complex at Wadi el-Jarf

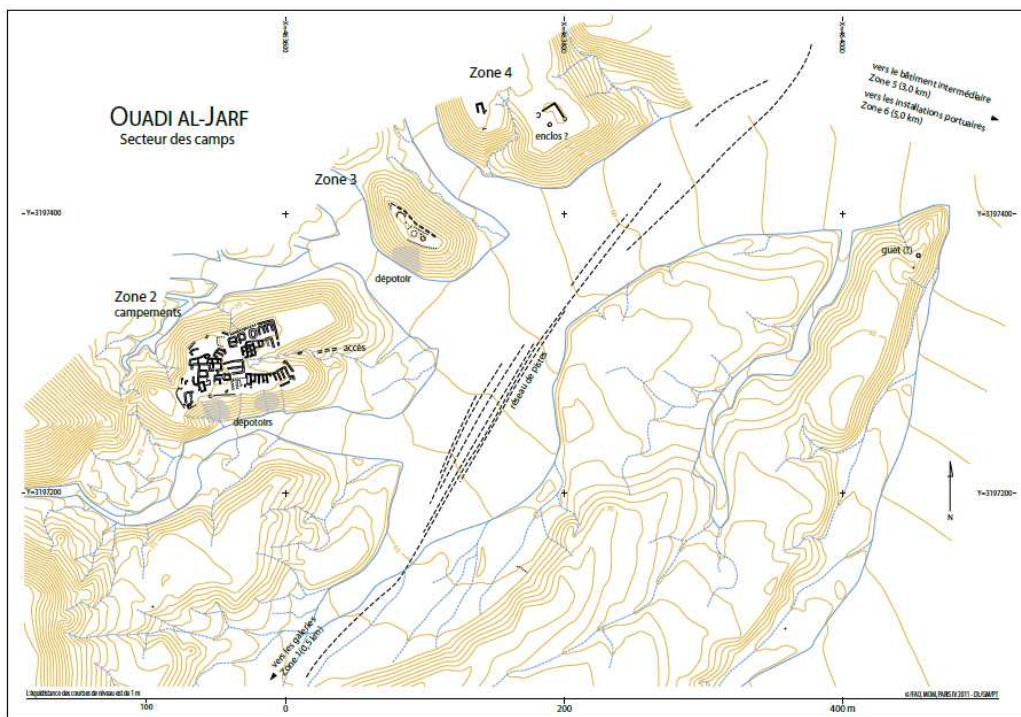


FIG. 6. Plan général des camps (Zones 2-4).

Figure 4: Wadi el-Jarf, Zones 2, 3, and 4, camping area

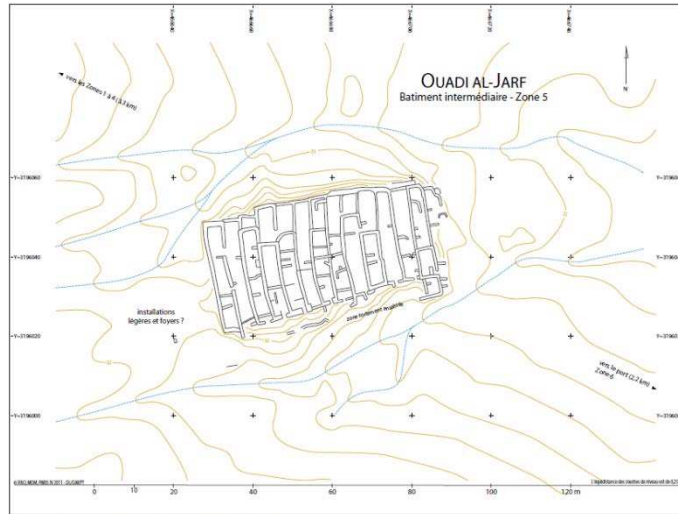


FIG. 7. Plan de la construction rectangulaire (Zone 5).

Figure 5: Wadi el-Jarf, Zone 5, intermediary building

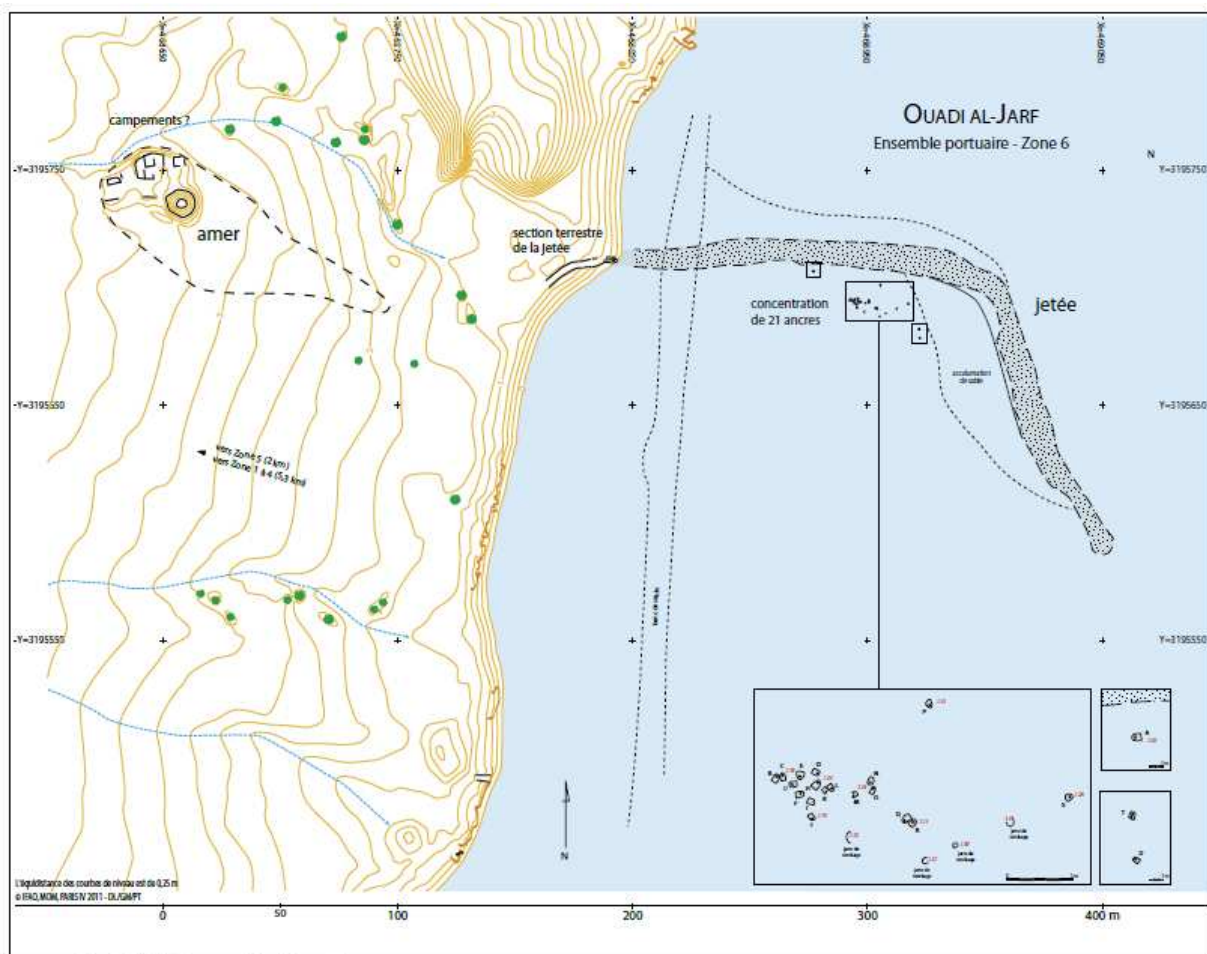


FIG. 9. Plan général de la zone côtière (Zone 6).

Figure 6: Wadi el-Jarf, Zone 6, jetty into the Red Sea with limestone anchors and jars

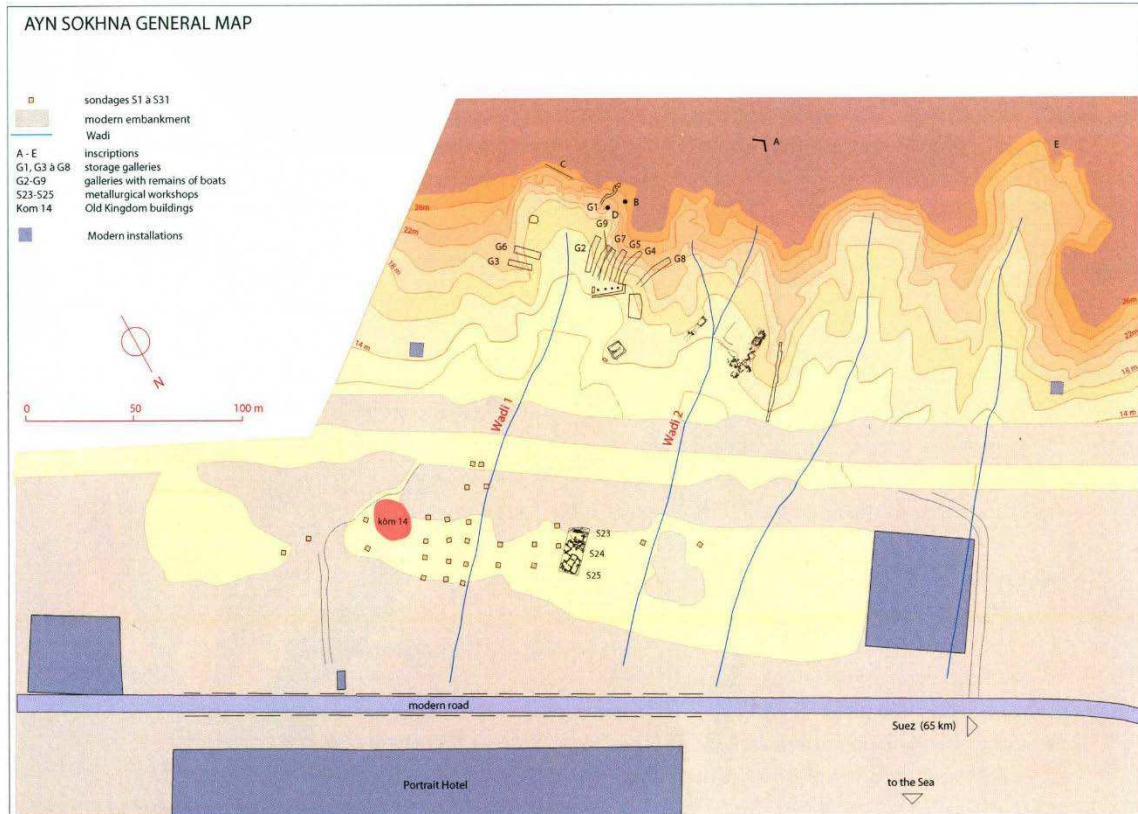


Fig. 3. Ayn Soukhna, map of the archaeological area.

Figure 7: General layout of Ayn Soukhna

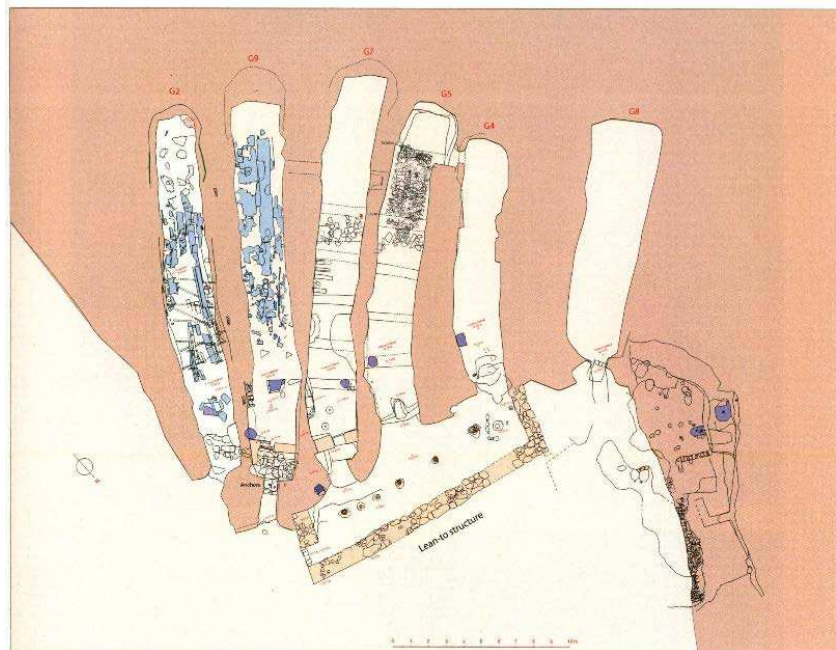


Fig. 5. Map of the rectangular structure built against the gallery complex.

Figure 8: Map of the grouped galleries and lean-to structure at Ayn Soukhna)



Figure 9: The lean-to structure at Ayn Soukhna in front of galleries G7, G5, and G4



Fig. 15. General view of "Kom 14".

Figure 10: Photograph of the "Kom 14" sector at Ayn Soukhna



Fig. 16. General view of the boat pit.



Fig. 17. Photograph of the boat pit, showing the holes carved in the sandstone.

Figure 11: Photographs of the boat-pit at Ayn Soukhna



Fig. 11. General view of copper workshop I.

Figure 12: Photograph of one of the copper workshops at Ayn Soukhna

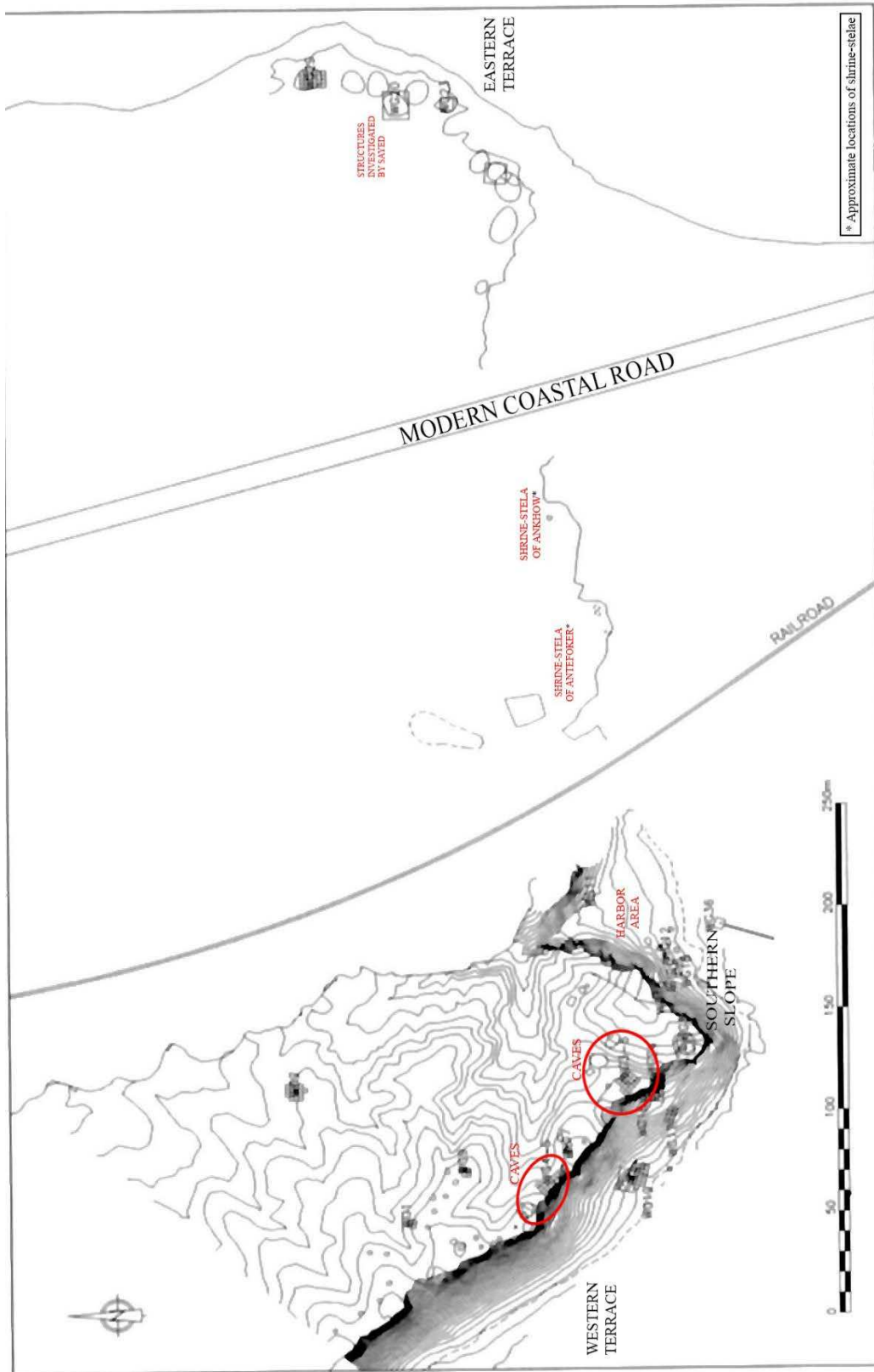


Figure 13: Map of Mersa/Wadi Gawasis (after Fattovich & Bard 2007)

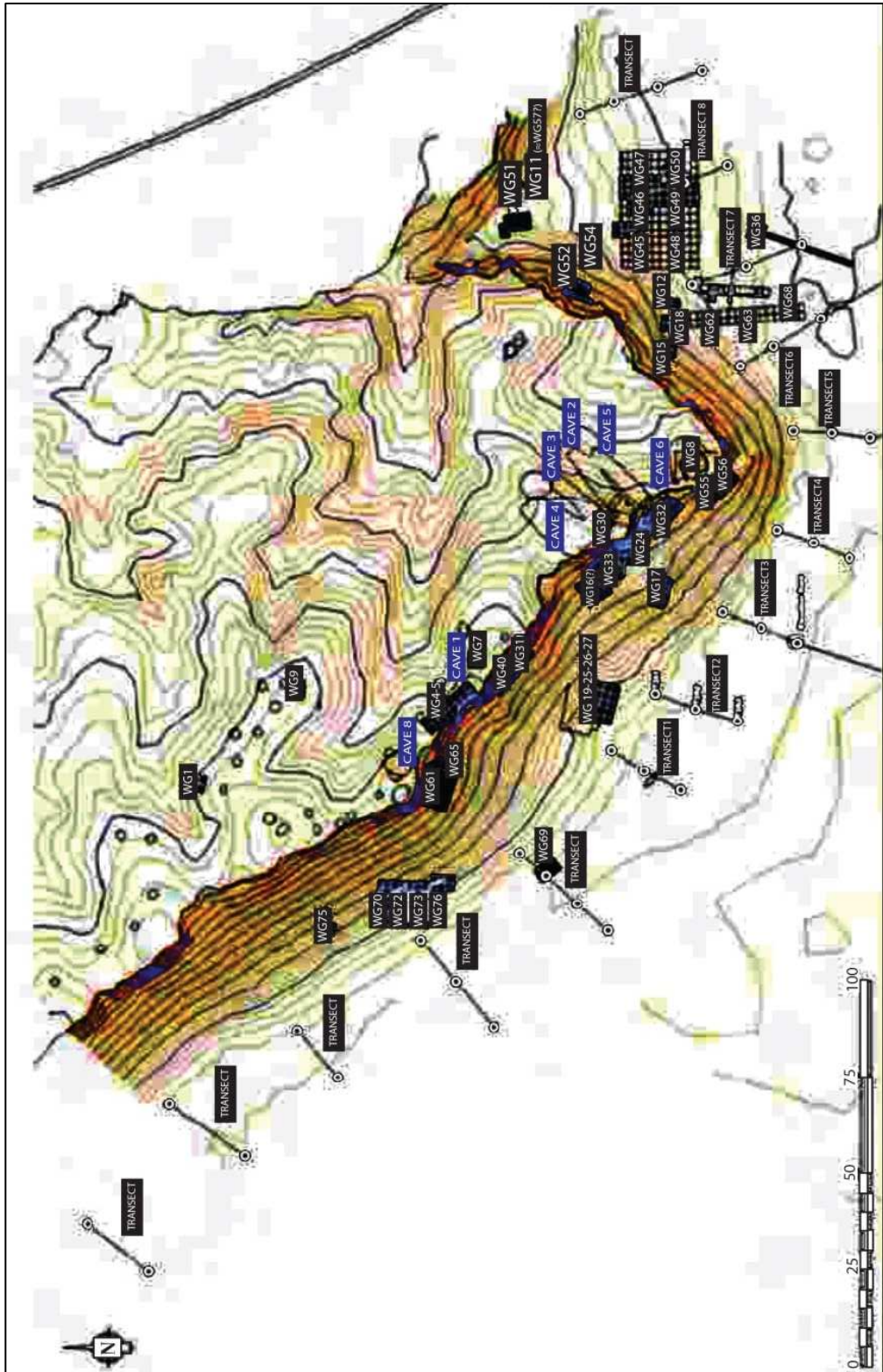


Figure 14: Map of Mersa/Wadi Gawasis with select excavation units (after Fattovich, Bard, and Ward 2011)

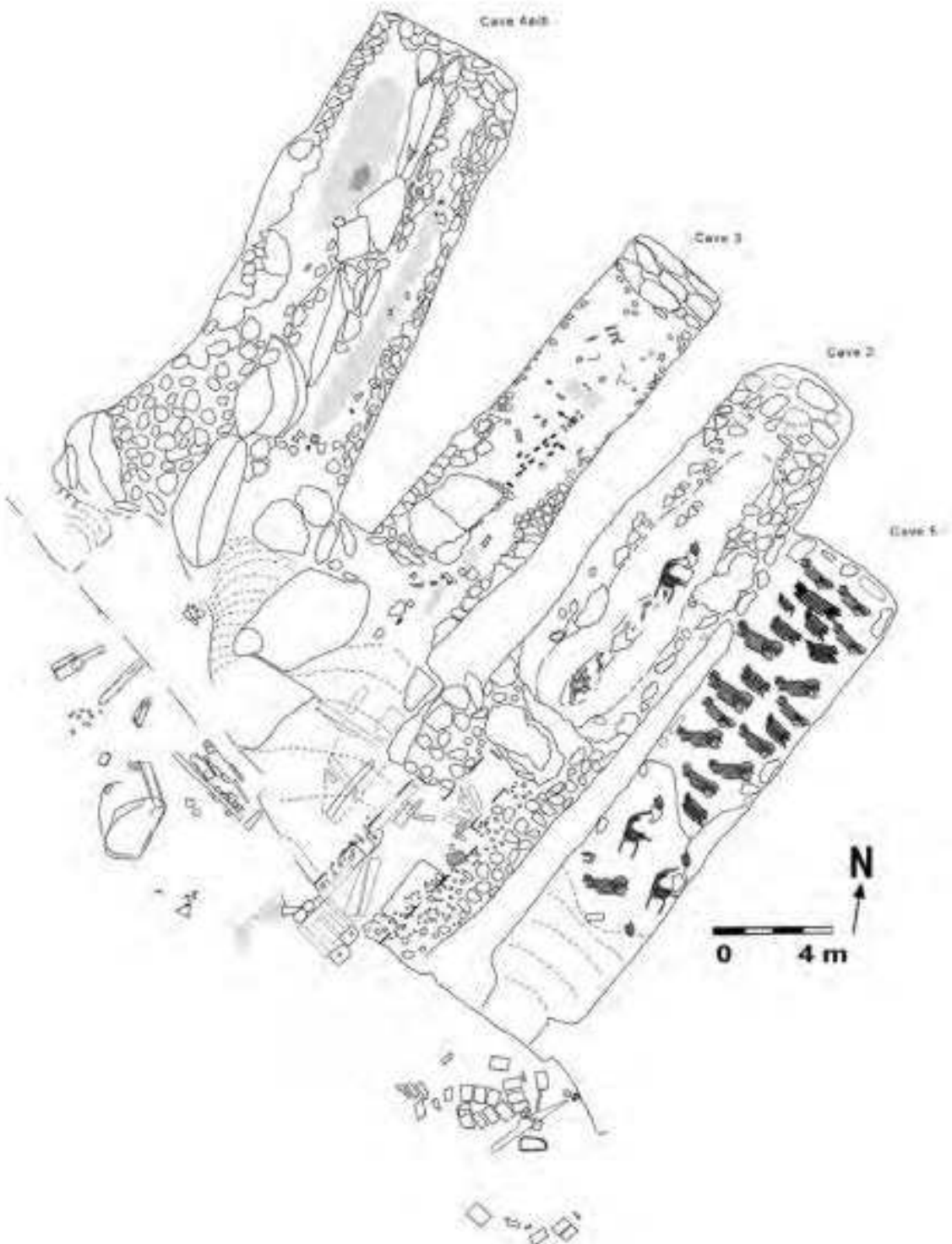


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Figure 15: Map of caves 2, 3, 4a/b, and 5 at Mersa/Wadi Gawasis with intersections

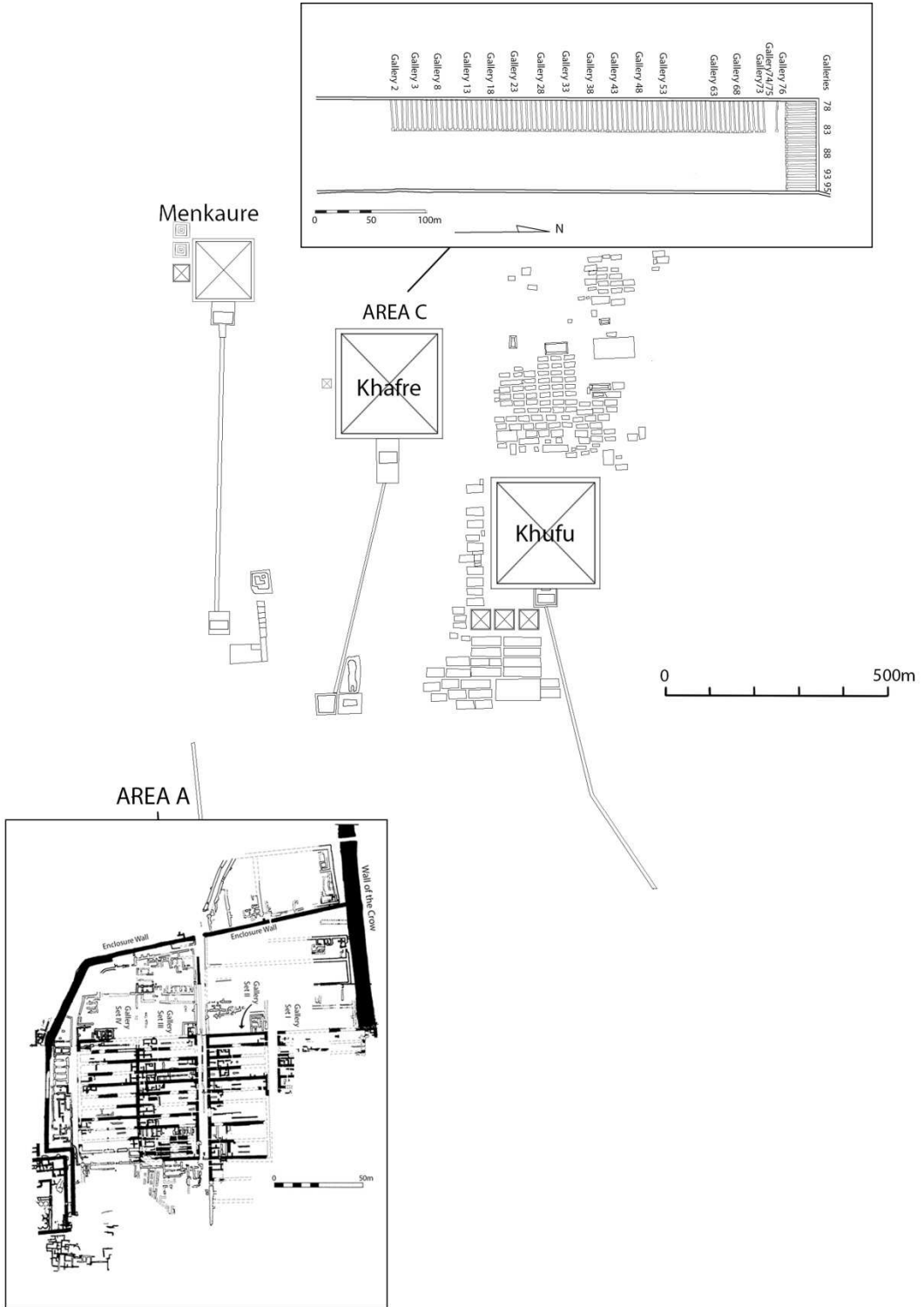


Figure 16: Giza Plateau with details of the galleries in Area A and Area C (after Conrad & Lehner 2001, Lehner 2002)

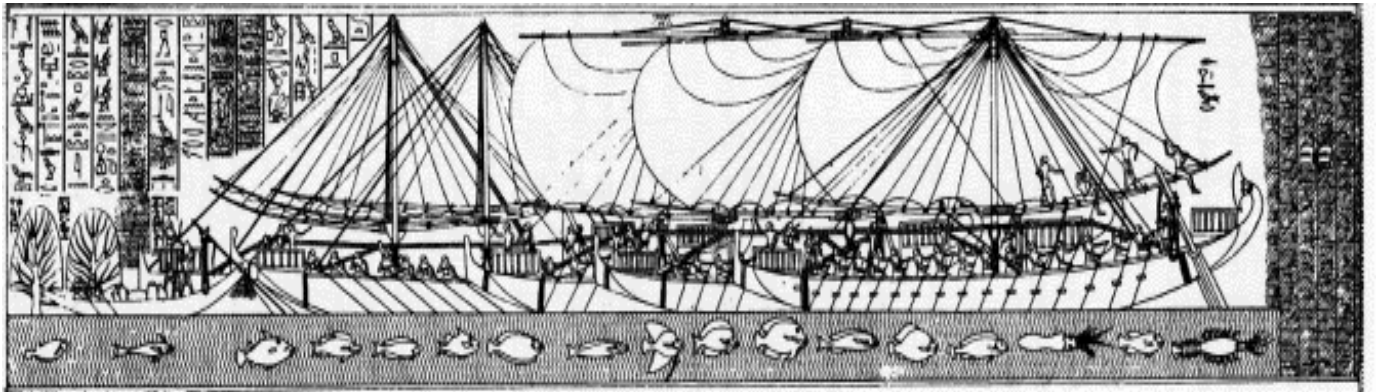


Figure 17: Punt relief at Hatshepsut's mortuary temple at Deir el-Bahari

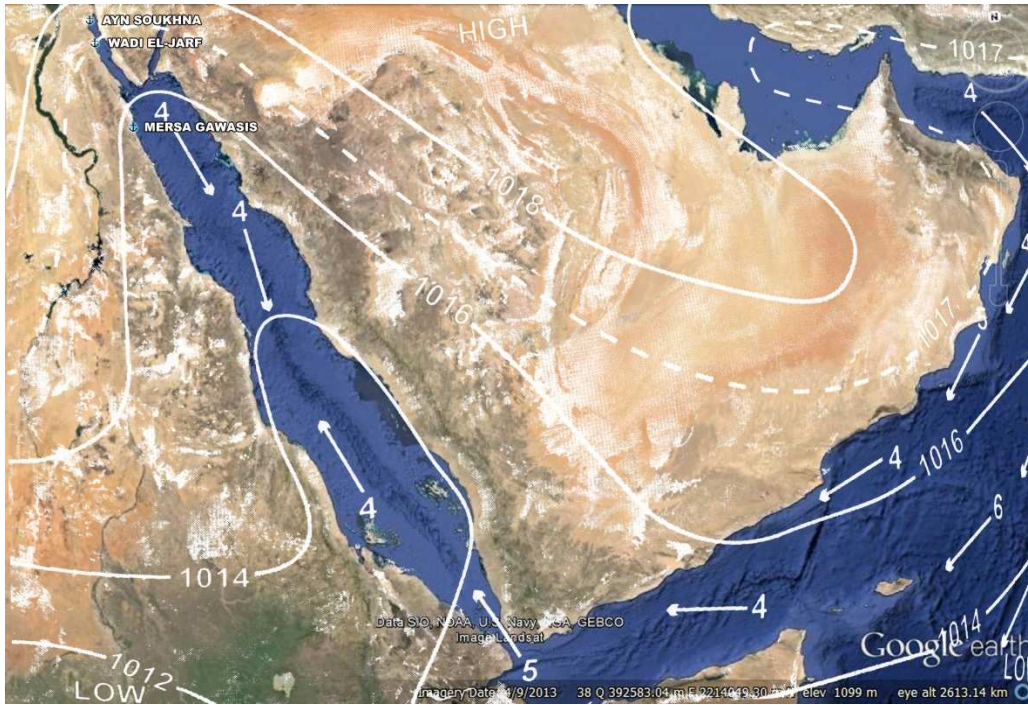


Figure 18: Red Sea wind patterns in January (patterns, dominant winds and barometric values taken from William Facey (2004) figure 4 and overlaid on GoogleEarth imagery)

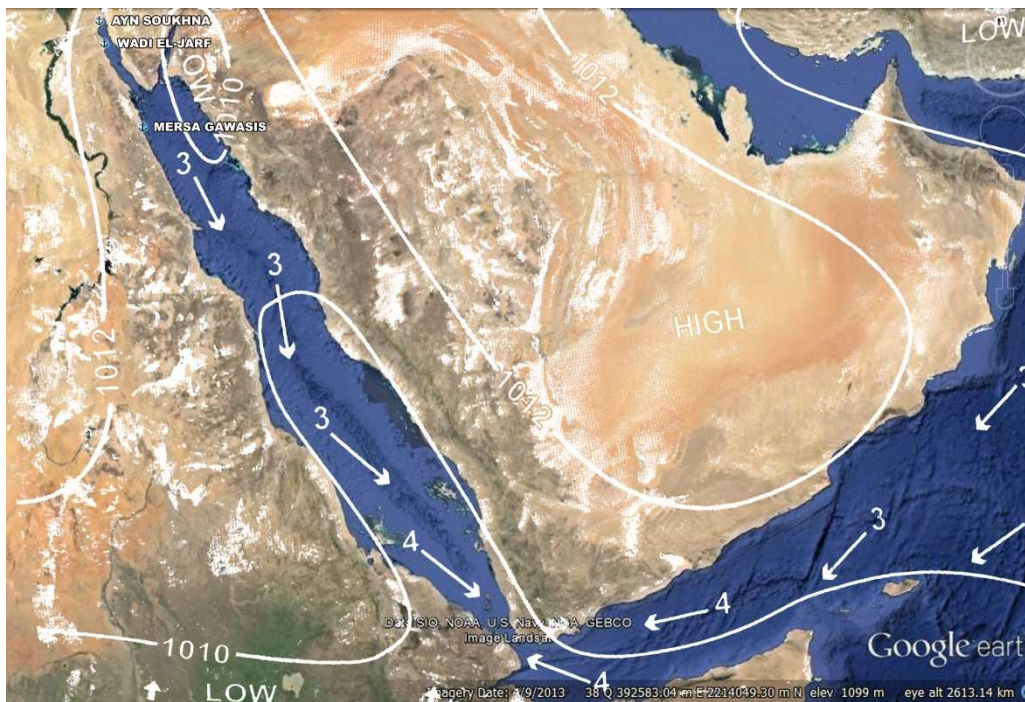


Figure 19: Red Sea wind patterns in April (patterns, dominant winds and barometric values taken from William Facey (2004) figure 1 and overlaid on GoogleEarth imagery)

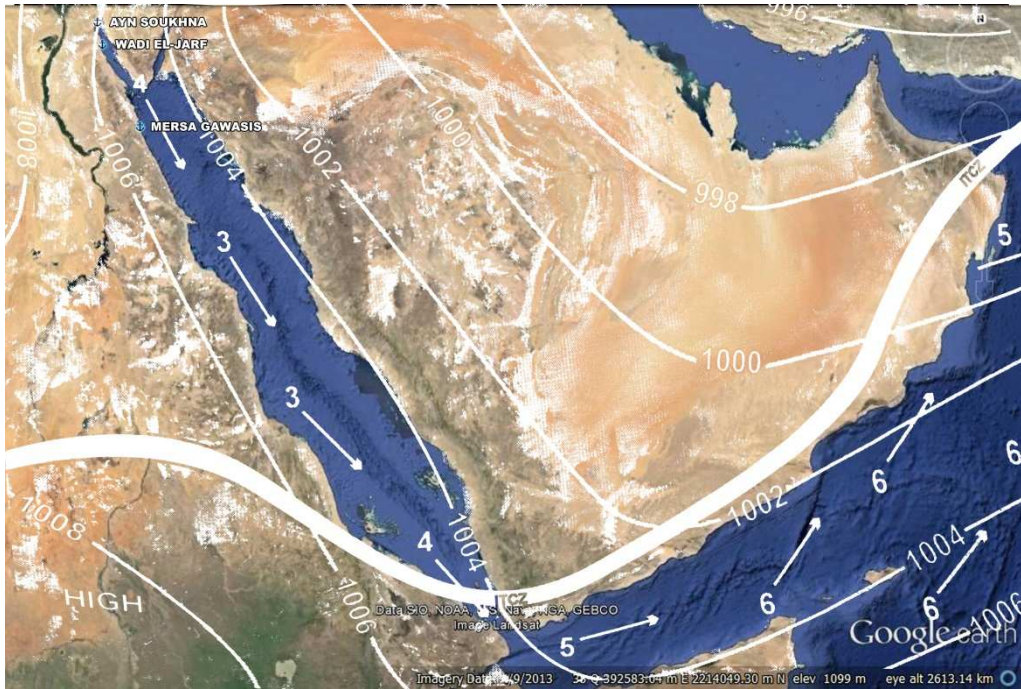


Figure 20: Red Sea wind patterns in July (patterns, dominant winds and barometric values taken from William Facey (2004) figure 2 and overlaid on GoogleEarth imagery)

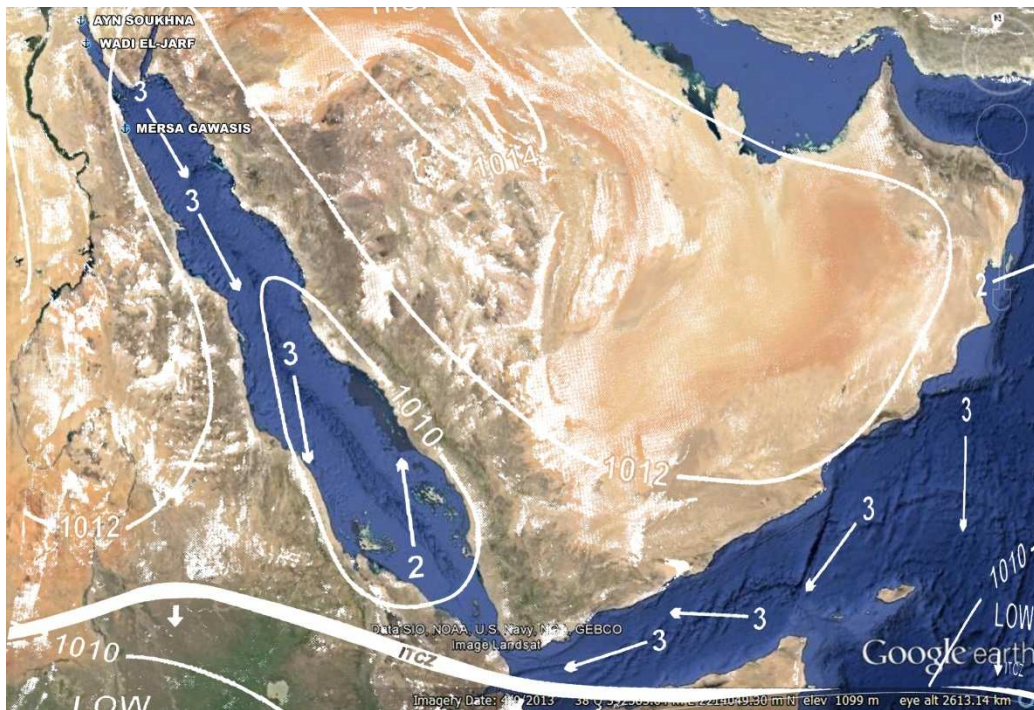


Figure 21: Red Sea wind patterns in July (patterns, dominant winds and barometric values taken from William Facey (2004) figure 3 and overlaid on GoogleEarth imagery)

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