CHAPTER 28 Considering Sabkha Ghuzayyil

Lake Tritonis in Coastal Cyrenaica

The preceding two chapters established the geographic and environmental setting for the myth of the Argonauts in Libya. Based on ancient narratives and their correspondence to known natural features, I place the former Lake Tritonis in the southeastern Gulf of Sirt, also called the Gulf of Sidra. For reasons established in this chapter and the previous chapter, I speculate that the now-extinct lagoon may have been located in or near the ancient equivalent of today's Bight of Brega near the modern port of Marsa Brega, also known as Marsa al Burayqah, in the modern regional municipality of Ajdabiya, Libya.

Perhaps Lake Tritonis approximately coincided with today's Sabkha Ghuzayyil (Figure 7), which constitutes the least elevated region of modern Libya. Three thousand years ago, the ancient version of this depressional sabkha could have been situated adjacent to the gulf shore. Over three millennia the coastline changed, probably moving northward owing to normal marine and geological processes and blowing sand. Consequently, today's Sabkha Ghuzayyil is situated inland from the Gulf of Sirt.

From Lake Tritonis, the Argonauts' coast-hugging departure took them one day's sail northeastward past the coastal scarps of the western Jebel Akhdar where the coastline begins its lengthy, pronounced curve around the limestone-dominated Cyrenaican headland. Adhering to Triton's instructions (Chapter 27), the Argonauts sailed straight rather than following the Cyrenaican coastal curve toward Egypt. After a day of sailing followed by two nights and a day of rowing, the Argonauts approached Carpathus, a Greek island between Crete and Rhodes.

MY VIEW OF PHYSICAL LAKE TRITONIS

To me, Lake Tritonis may have been a laterally expansive lagoon–sabkha complex comprised of two parts: variably enclosed reef-waters and shoal-waters situated seaward of the main coastline, and a large, low-lying marine sabkha environment that in places was traversed by the lower reaches of one or more wadis. The sabkha environment in places contained lagoon-waters, depressional intertidal channels, and salt marshes.

I envision the offshore part of Lake Tritonis as perhaps either a tidal-bar belt or a fanlike series of shoals protruding seaward from the general line of the beach. This seaward component was enclosed by low barriers formed by rocky reefs and abundant shoals and sandbars.

I envision the onshore part of Lake Tritonis as a lagoon extending landward from the shoreline and in many places occupying a low-lying marine sabkha, which is a type of tidal salt flat in an arid coastal zone (Chapter 26). The landward portion of Lake Tritonis was situated among sandbars, windblown sand dunes, fossil dunes, sandy ridges, and low carbonate plateaus.

Perhaps the seaward and landward components of Lake Tritonis were differentiated at one locale by a major barrier bar that was the large, inhabited island of Hisperia referenced by **mythographers**. Or perhaps the island was a flat-topped, amalgamated tidal bar, a sandy ridge, or a low plateau surrounded by water.

In areas of the lagoon away from the island barrier, surface-water communication between land and sea depended on tidal and weather conditions. Sandy land surfaces were dissected by flood-tide channels that provided limited in-lake navigability. Where they were not blocked by sandy barriers, these depressional channels exited to the sea, although rarely as navigable passages. During high tide, seawater flowed through these channels to enter onshore parts of Lake Tritonis. Seawater driven overland during storms flooded much of the lake.

TRITONIS'S MAZE OF SHOALS

Lake Tritonis's limited navigability indicates that some portions of it were fairly deep. This is consistent with a shoal complex wherein depressions create an interlaced complex of sinuous intershoal channels that in some places could float a vessel during times of high tide and high rainfall.

Before Triton appeared, the Argonauts were attempting to sail their way out of the lake but were defeated by the maze of shoals (Chapter 27).

Apollonius Rhodius compared the *Argo*'s aimless, winding path to a snake wriggling across the hot sand, looking for a cool cleft in a rock. I find the analogy apt because a submarine cleft, in my opinion, is probably what allowed the Argonauts to sail into the open sea.

Apparently the *Argo* could navigate some intershoal channels, but none of these navigable channels connected to the open sea. As I see it, the single navigable gap between Lake Tritonis and the open sea may have been either a submerged wadi valley or a cleft in the underwater rocks. Geological processes yielded this site-specific channel which was semi-permanently to permanently inundated with seawater. The submerged channel provided a narrow, relatively deep passage in an otherwise shallow-water environment.

The Wadi Triton

In my reading, the River Triton must have been a semi-perennial wadi that emptied into Lake Tritonis and whose mouth and lower reaches formed part of the larger Lake Tritonis lagoon–sabkha complex. As Chapter 26 explains, a wadi is a gully or ravine that usually is dry but becomes a torrent after heavy rains.

The Wadi Triton probably carried silty, sandy freshwater during rainstorms. The wadi also may have been spring-fed in its lower reaches, and perhaps in upper reaches as well. Hence, wadi flow would have included some **groundwater** discharge.

In addition to the Wadi Triton, one or more seasonal wadis probably emptied into the Lake Tritonis basin. Today these extinct wadis must be covered by windblown sand and higher relative sea levels, and therefore lost to unaided human view. (The "viewing aids" to which I refer are scientific instruments used by today's earth scientists.)

Perhaps sand and sediment barriers in wadi mouths impounded estuarine waterbodies that extended far inland during stormy, rainy periods. Today we know that certain present-day estuarine lagoons in wadis can temporarily extend many kilometers inland. (As noted in Chapter 26, the descriptor "estuarine" in this context is associated with wadis and does not refer to a typical tidal estuary.)

Hidden Karst of Tritonis

I speculate that at least part of Lake Tritonis possessed a **karst** subsurface. In part, the vast depressional bed of Lake Tritonis could have been

the surface expression of a laterally significant dissolution feature. One or more site-specific features within the expansive karstic environment may have been collapse craters having subterranean connections either to seawater, groundwater, or both.

Over the centuries, karst structures must have been altered by rapid surface disintegration of friable limestones, disruption by earthquakes, submersion by coastal subsidence, and burial by blowing sand. Collectively, these forces caused identifiable karst landforms to be lost. Consequently, we do not immediately recognize as karstic the present-day landscapes near the Bight of Brega and Sabkha Ghuzayyil. Yet the geologic evidence may be lying beneath the Libyan sands, awaiting exploration.

The Navigable But Unseen Mouth: A Submerged Wadi?

To me, it is important to notice that the experienced sailors of the *Argo* could not find a water path deep enough to float their ship back to the open sea. Because they would not have overlooked a clearly visible navigable outlet, the navigable location must have been hidden from normal eyesight. If a narrow, navigable channel was under turbid (cloudy) or choppy waters, or if it was in an unlikely location, the Argonauts would not have seen its submarine location.

When discussing the mouth of the lagoon, Apollonius Rhodius refers to reefs and high-energy waves. To me, this reinforces the idea that a combination of reefs and sandy shoals formed a nearly continuous barrier around the lagoon. Today reefs front many areas of the Gulf of Sirt coast, providing protective barriers for beaches.

Although there could have been many small, shallow openings between Lake Tritonis and the sea, apparently only one opening was navigable. I believe the navigable passage was probably a submarine wadi or a cleft in a rocky, reefy coastal shelf. Today many wadis cut down into the rocky platform of Cyrenaica's Jebel Akhdar. Lower reaches of some of these wadis would have been submerged where they empty into the sea.

Probably owing to peculiar eddies and currents related to karstic submarine conduits and flows, the narrow passage remained relatively free of sediments that otherwise filled coastal seabed depressions. I envision a submarine karst ravine extending from the bed of a seasonal karst lake and emptying into the sea where seabed conditions and narrow passages concentrated the energy of incoming waves.

A modern indicator of the narrowness of some wadis is the Wadi el

Atrun east of Marsa Susah. In places the wadi is only two meters wide and flanked by nearly vertical sides of soft limestone. Perhaps the submerged passage through which Triton guided the *Argo* was similarly structured, and barely wide enough to accommodate the vessel.

MYTHOGRAPHIC OVERLAPS: PERSEUS, MEDUSA, AND A VOLCANIC PALL

The chart in Chapter 27 provides my speculative timeline for the days between the onset of the Peloponnesian gale and the *Argo*'s return voyage to the Sea of Crete. The chart shows the possible interweaving of events in the Perseus–Medusa, Heracles–Ladon, and Argonaut–Tritonis myths. The chronology is drawn largely from the account of Apollonius Rhodius.

In my understanding, Perseus killed Medusa (Chapter 15) on the same day that *Argo* was wave-driven onto the Libyan mainland. This event caused Medea and the Libyan nymphs to bewail Medusa's death all night, which was the first night the Argonauts were onshore. The next day, the Libyan nymphs appeared and prophesied to Jason as described in Chapter 27.

The Perseus myth further overlaps with the Argonaut myth regarding broods of vipers that sprang from Libyan sands. When Perseus flew eastward carrying Medusa's severed head, the drops of blood hitting the sand caused vipers to emerge. Perseus's flight path generally followed the North African coast.

I see a possible connection between the earthquake that affected the Tritonis region and the vipers that emerged. The history of science is filled with anecdotes of unusual animal behavior immediately preceding an earthquake. The snakes may have been agitated by precursor tremors, causing them to emerge from their subterranean lairs.

While the Argonauts were portaging, Perseus was aeroplaning over the same coastal terrain via Hermes' winged sandals (Chapter 15). By the time the Argonauts reached Lake Tritonis, the vipers in Perseus's wake were already in place. The Argonaut named Mopsus fatally encountered one of them.

Not a Drop for Drinking

In the Lake Tritonis lagoon–sabkha complex, high evaporation rates combined with variable influxes of seawater and freshwater created a dynamic water level and changeable water chemistry. Lake Tritonis probably obtained most of its salinity from seawater connections at surface and

subsurface levels. In addition to surface inflows through lagoon openings and overland storm surges, the lagoon may have received seawater seepage through sandy sediments and subterranean karst conduits.

Inflow from wadis and fresh groundwater sources further contributed to the lake's water levels while moderating its salinity. Springs, spring-fed lagoons, and different types of submarine and subterranean groundwater discharges are found today along parts of the Libyan coast, just as they are found in many parts of the world. Coastal Cyrenaica contained significant submarine springs as late as the 1970s and 1980s. (I was unable to find more recent confirmations of continued springflows.)

Pall of Darkness

The end of the Argonaut–Tritonis myth appears to transition to a period of real-life earthquake activity and an eruption of a volcano. Commentators variably interpret the story of Talus and also the "pall of darkness" which the Argonauts witnessed in the Sea of Crete near the island of Anaphi. In my opinion, most commentators are unduly persuaded by extremely rare events and therefore inappropriately connect the Argonauts' dramatic encounter with the one astounding eruption of Thera described in Chapter 29.

Because I do not feel compelled to attribute ancient myths and societal upheavals only to the most extreme events of record, I think the mythographical account of the Argonauts could have been describing natural events leading to one eruption among many historical eruptions in the South Aegean. Besides the famous Theran eruption, any one of many lesser eruptions on Thera or elsewhere could have had sufficient strength to cause a pall of volcanic ash.

For modern commentators, it is convenient to attribute the thick pall to the Theran volcano, because the volcano and its island still exist above the sea surface. The island of Thera (Santorini) is visually impressive and is easily available for scientific study. Indeed it is one of the most thoroughly studied volcanoes of the Mediterranean.

Despite the status of Thera as a scientific celebrity, its ancient ash clouds were not the only ones possible near Crete. As I see it, an ash cloud could have been caused by the eruption of some other ancient island volcano long buried under the sea. We know that the Colombo Bank volcano, for example, once was above the sea surface but is now below it. Perhaps another volcano existed but its remnants remain undiscovered. I find the

image of an ancient volcanic pall no less compelling simply because it may have derived from an extinct, anonymous, undiscovered volcano.

In any case, the Argonauts' tale gives us rich insight into the natural world of ancient Greece.

WHERE WAS LAKE TRITONIS? (PART TWO)

In Chapter 26, I explained that many commentators place ancient Lake Tritonis in modern Tunisia. But for reasons given in the previous chapter and in this chapter, I think that Lake Tritonis was much closer to Egypt: namely, near the head of the Gulf of Sirt where the Sirtica grades into the Cyrenaican headland. Besides the Benghazi vicinity, easy points of reference are the Bight of Brega and the Sabkha Ghuzayyil (Figure 7).

Sailing from Marsa Brega to Phycus Promontory

To me, the narrative of Apollonius Rhodius suggests that the coast either is already trending northward where the Argonauts left Lake Tritonis, or it trends north very shortly after they set sail. If Lake Tritonis was located in Tunisia, the Libyan god Triton surely would have instructed the Argonauts to hug the Sirtian coast as it first trends a long way eastward across Tripolitania and Sirtica, then eventually turns northward in Cyrenaica. But because Triton said only to follow the coast northward, I envision the deepwater harbor of rescue being located in the southeastern Gulf of Sirt, probably near the Bight of Brega.

If a modern vessel leaves the port at Marsa Brega (Burayqah) and follows the coast generally northward, it will be heading gradually northeasterly until reaching the vicinity of the city of Ajdabiya. The coast there curves to the northwest and is trending slightly northwest as it passes the coastal town of Qaminis (Figure 7).

Between Qaminis and the modern city of Benghazi, the coast begins its lengthy curve which culminates near Marsa Susah, which is located approximately at the northernmost extent of the coastline's general arc. Marsa Susah is near the ancient site of Apollonia, which served as the port for Cyrene.

When describing the Argonaut's departure from the coast into the open sea, Apollonius mentions the projection of a cape, which I believe to be the Phycus promontory (today's Hamamah promontory, also called Ras el Hamama). According to Strabo, this low-lying point of land was 33 kilometers west of Apollonia and jutted beyond the general coastline, making it

the northernmost projection of land in ancient Cyrenaica. As I see it, the Argonauts followed the coast of Cyrenaica generally northward, and then sailed strait ahead once they reached the tip of the Phycus promontory.

The Phycus promontory is roughly 325 kilometers from the inner recess of the Gulf of Sirt, which is where I assume that Triton had led the *Argo* into the open sea (Chapter 27). The promontory is within a day's sail of ancient Euesperides (modern Benghazi), where the Garden of the Hesperides probably was located. Strabo says that the distance from Euesperides (also called Berenice) to Phycus is 160 kilometers. Further, Diodorus Siculus says that an inscribed bronze tripod commemorating Triton's rescue of the Argonauts stood until "rather recent times" (relative to Diodorus's lifetime) among the people of Euesperides.

A one-day sailing timeframe matches Apollonius Rhodius's description that the Argonauts quit the coast the day after the morning on which they had departed Triton's deep-water harbor. Tunisia is much too far west to accommodate such a short sailing time.

Regarding the return voyage to the Peloponnese, Apollonius tells us that the Argonauts first saw the land of Carpathus, a Dodecanese island east of Crete. Apollonius says that once the Argonauts started traversing the open sea, their homeward voyage took a little over one day of sailing plus one day and two nights of rowing.

Strabo estimated the distance between Phycus and Taenarum (Greece's Cape Matapan) to be about 575 kilometers. The distance from Phycus to the southeast coast of Crete is roughly the same. So the distance to the waters east of Crete would be slightly greater.

The Muddled Pseudo-Scylax

The narrative of Pseudo-Scylax contains a brief passage on the Lotus Eaters. In this passage, the narrative is organized using a westward progression from Cyrene toward Carthage. Pseudo-Scylax's rambling account references a Small Syrtis as being inside a great gulf. He then names the island Tritonis, the River Triton, a sanctuary of Athena, and a lake with an island in its mouth. Presumably he meant Lake Tritonis.

In general, Pseudo-Scylax's narrative describes geographic features encountered by navigators sailing from east to west. But when he describes the Tritonis region, it appears that his narrative sequence is adding detail to an area already described. He references "the other Syrtis" and the Tritonis features found in "this" Syrtis.

It is difficult for me to tell whether Pseudo-Scylax is describing the Gulf of Hammamet between modern Tunisia's Sousse and Nabeul, or the Gulf of Gabes farther south (Figure 7). To me, the "other" Syrtis therefore could be interpreted as either the Tunisian Gulf of Gabes or the Libyan Gulf of Sirt. The latter interpretation is possible because Pseudo-Scylax identifies Leptis Magna as being "after" or presumably west of the Tritonis-containing Syrtis. In any case, the centuries of copying, transcriptions, and translations yield a muddled narrative with no single definitive interpretation.

A Sirtian Sabkha Like Ghuzayyil

The Gulf of Sirt coastline is flat and generally arid. The coast is lined with dunes, scrubland, lowland plains, and significant sabkhas and salt marshes. In most areas, coastal waters are shallow near the shore and for a considerable distance offshore.

Various sabkhas along the Gulf of Sirt coastline are below sea level. In the Mediterranean Sea region, the amount of depressional land on the Sirtian coast is geographically comparable to Israel's Dead Sea and Tunisia's Chott el Jerid. Low-lying sabkhas can form saline lakes where the wind-driven sea rushes overland, or where underground water levels rise to above the land surface.

Modern Libya's least elevated area, the Sabkha Ghuzayyil, is 47 meters below sea level. As Figure 7 shows, it is located south of Marsa Brega (Burayqah). Today the salt pan covers 500 square kilometers and is part of the desert limestone plateau. I wonder whether the ancient equivalent of Sabkha Ghuzayyil formed the inland portion of Lake Tritonis. The general location is consistent with mythographical accounts, and its large depressional area would have contributed to Lake Tritonis's expansive nature.

Even though Sabkha Ghuzayyil today is located inland, its ancient equivalent easily could have been located at the Gulf of Sirt shoreline. Over nearly three millennia, blowing sand could have combined with marine and geological processes to move the coastline farther north. Today we know that the *ghibli* often carries sand and dust into the Gulf of Sirt, contributing to siltation in some harbors. (In Libya the ghibli is a hot, dry desert wind from the southwest, south, or southeast that typically occurs in spring and fall, lasting from one to four days.)

If the Sabkha Ghuzayyil was not part of Lake Tritonis, then any number of other sabkhas could have been. Although today's coastal zone is

far different and much drier than the ancient setting, the presence of modern-day sabhkas gives an indication of the vast water environments that once must have existed.

Personal communication with Professor Mamdouh Shahin confirmed that in the geological and historical past, many salt flats close to the Sirtian seacoast were alternately covered and uncovered by seawater. During wet periods, sabkhas would become part of the southeastern Gulf of Sirt. In dry periods, the sabkhas became either saltwater lakes or dried salt flats.

MOUNTAINS, RELATIVELY SPEAKING

The Sicilian Greek historian Diodorus Siculus wrote in approximately 55 BC that the marsh of Tritonis was in the west near the ocean which surrounds the Earth: in other words, Lake Tritonis was near Oceanus, which by Diodorus's time had been reinterpreted as the Atlantic Ocean.

The marsh of Tritonis, says Diodorus, received its name from the River Triton which emptied into it. Tritonis was near Ethiopia and a locally high mountain that impinges on the sea. One translation says the "greatest local mountain, which the Greeks call Atlas."

Diodorus appears to annotate the traditional account with a single passing reference to Atlas. Unknown is whether this added phrase was one of his edits to an older narrative for the purpose of accommodating the more advanced Roman knowledge of Mediterranean geography.

Further, the word "mountain" is defined in ancient and modern Greece by its opposition to "the plain," and is not limited to highly elevated landforms. Hence, if the word "mountain" is broadly interpreted to include a plateau, hillock, or bluff rising above a landscape of relatively low relief, then Diodorus's description could fit any number of locations on the North African coast. Generally speaking, the Cyrenaican headland between Benghazi on the west and Tobruk (Tubruq) on the east is a coast backed by conspicuous high ground. Even the distinctive shape of the jutting Cyrenaican headland containing these highlands can be said to impinge on the sea.

From the coastal plain between Benghazi and Darnah, the Cyrenaican terrain rises abruptly to reach a high limestone plateau called the Jebel Akhdar, or Green Mountain, so named because of its trees and other leafy vegetation. The western side of the Jebel Akhdar falls steeply to the Gulf of Sirt.

Several coastal locations between Benghazi and Tobruk contain notable hills, ravines, and seaside caves. Western portions of the Cyrenaican headland closely match the mythographical descriptions of the Argonauts' stranding: namely, proximity to the Mediterranean Sea, locally high mountains, and caves which serve as home for the nymphs. As I describe elsewhere in these chapters, I think that the karstic vicinity of Benghazi is the likely location of the Garden of the Hesperides.

Another interesting location is near modern Marsa Susah (ancient Apollonia), which is situated between two hills. Along the coast about 14 miles west of Marsa Susah are prominent hills which rise steeply from the beach to heights of over 200 meters. Their wall-like seaface is broken by deep ravines. Southwest of Marsa Susah is the promontory of Ras al Hamamah, which contains the mouth of a large cave. Similarly, the bayshores of Marsa al Hilal northeast of Marsa Susah contain large caves.

What About Atlas?

Herodotus describes a Libyan mountain that the native Libyans call the Pillar of Heaven and that he calls Atlas. It is small in circuit, rounded on every side, and so lofty that a person cannot see its summits, which remain obscured by clouds in summer and winter. This mountain is located in the Libyan sandbelt amongst salthills, many of which contain springs.

To the Greeks and Romans, the name "Mount Atlas" may not have meant the singular Mount Atlas on modern maps. Instead, such a name could have referenced any number of coastal locations in today's "Atlas Lands" of Morocco, Algeria, and Tunisia. Even a Cyrenaican Atlas was possible.

Perhaps the Atlas Mountains to which Latin writers referred were an editorial modification to replace the plateaus of Cyrenaica's Jebel Akhdar with mountains farther west. For the reasons I described earlier in this chapter, ancient writers surely edited stories to reflect their state of knowledge, opinions, preferences, traditions, and experiences. When the stories of the Argonauts first circulated, the average Greek citizen would have known about the highlands along the Mediterranean coast nearest to Egypt, but not necessarily about the Atlas Range in the far western Mediterranean.

I find it interesting that the Hellenistic geographer Ptolemy (second century AD) referred to the Cyrenaican mountains called the Mounds of Hercules. Knowing that the ancient myths made connections between

the heroic Hercules (Heracles) and the mountain-holding Atlas, I expect that ancient stories and texts would have widely intermingled names and locations. I doubt that the ancient geographers recognized only one zone of Atlas Mountains, as we do today.

On some Roman-era maps, the Mounds of Hercules on the Jebel Akhdar are near mapped features called the Garden of the Hesperides, Lake Tritonis, and the River Lathon. Prior to Ptolemy, Strabo had referred to the River Lathon as emptying into the harbor of the Hesperides near the promontory on which Euesperides (Berenice) was situated. He states that the promontory is near a Lake Tritonias (as spelled in one translation) which contains an island on which stands a temple of Aphrodite. Given the unreliability of many transliterations and translations, I find the similarities to the geography of the Argonaut–Tritonis myth more compelling than the differences in spellings.

ISLANDS AND FIRE

Intriguing to me are the isolated hills and plateaus near the Bight of Brega in the southeastern Gulf of Sirt. For example, about 27 kilometers northeast of modern Marsa Brega stands the Jebel Lamarese, a prominent hill with a truncated summit roughly 62 meters high. West of Ras Lanuf near As Sidr, the Jebel al Mudawwar is a 121-meter high, flat-topped mountain which is conspicuous from seaward. In the same region, Ras al Uwayja is a high, rocky, and prominent cape.

In ancient times, these types of hills could have been either temporarily or permanently surrounded by coastal waters owing to the higher relative sea level. If so, any one of them could have satisfied the ancient definition of "island." Additionally, as I described in the previous chapter, shoals, barrier bars, and coastal ridges could have been called islands.

Modern coastal Cyrenaica contains various features characterized by white sand and sediments. For example, in today's Gulf of Bomba at Marsa as Sahl is a cove with three large white patches on the coast. Nearby is a notable cave with a circular mouth tens of meters above the water. Also nearby is a large and conspicuous white sand dune. In ancient times, such dunes could have inspired the name "White Isles,"particularly if the dunes were situated in either the subtidal or intertidal zone.

The notable "island" in Lake Tritonis could have been either a large barrier bar or other sand body between the sea and the back-barrier channel. It could have been flanked by one or more intershoal channels

that collectively surrounded the barrier bar with water. A barrier bar that was tens of kilometers long and several kilometers wide would have been consistent with the ancient identification of Hisperia, a large island with human settlement, fruits trees, and herds of sheep situated amidst or near the waters of Lake Tritonis.

Fire from the Earth

The geologic Sirt Basin offshore and onshore in the Gulf of Sirt is the richest oil province in modern North Africa. Modern Marsa Brega (also called Marsa al Burayqah) is home to major oil refineries, export facilities, and a liquefied natural gas plant. Other principal export terminals in the vicinity are located at As Sidra, Ras Lanuf, and Az Zuwaytinah.

The widespread presence of petroleum in the southeastern Gulf of Sirt appears to further support a Sirtian location for Lake Tritonis. Diodorus Siculus reports that the city of Mene was situated on a large island called Hisperia located near Lake Tritonis and near the Garden of the Hesperides. Mene was subject to great eruptions of fire and possessed a multitude of the precious stones which the Greeks called anthrax, sardion, and smaragdos. If these rocks were native to the region, perhaps they indicated the presence of anciently active gas seeps and **mud volcanoes**.

Mud volcanoes, which occur in areas with petroleum reserves, can erupt in dramatic displays of fire and mud. Mud volcanoes can occur in submarine settings as well as terrestrial ones. Additionally, natural gas seeps on land can sometimes erupt in flames if either human sources or natural sources provide an ignition.

AN EARTHQUAKE DRAINS LAKE TRITONIS

In the first century BC, Diodorus Siculus reports an old myth that Lake Tritonis "disappeared from sight" during an earthquake that "tore asunder" the parts of the lake lying toward the ocean. Another translation says an earthquake caused a tract toward the ocean to open its mouth and swallow up the whole morass of Tritonis. Although historical records are spotty from the Roman, Byzantine, and Medieval eras, they are sufficient to make plausible a Libyan earthquake either in Diodorus's lifetime or in the decades or centuries preceding it.

From recorded history we know that most major earthquakes in North Africa tend to occur in the Atlas Lands of Morocco, Algeria, and Tunisia. But earthquakes also occur in Libya and Egypt, as attested by modern

science. The following section on earthquakes is primarily drawn from a 2004 journal article by Dr. Abdunnur Suleiman of Tripoli's Al Fateh University.

Quake at the Lake

Libya usually is not considered seismically active, yet northern coastal regions have been affected by earthquakes originating either along the coast, offshore, or in the South Aegean. In the modern twentieth century, earthquakes in Libya clustered in two areas: the Hun Graben region in the western Gulf of Sirt, and the Jebel Akhdar region of the Cyrenaican headland.

Hun Graben is a prominent rift valley feature between the Saharan city of Hun and the near-coast city of Al Qaddahiya, south of Misratah. In 1935 a major earthquake and many aftershocks struck near Al Qaddahiya. People across Libya felt this earthquake, and 1935 was remembered as the "year of the shock." Other Hun Graben quakes were reported in 1941, 2000, and 2001.

In 1939 an earthquake and several aftershocks occurred in the Gulf of Sirt area. Several tremors were felt in Tripoli and in areas near Tunisia in the nineteenth century. A powerful earthquake destroyed Tripoli in 1183. A quake in the early eighth century affected much of Libya, especially in the vicinity of Sabha. A quake in the early fourth century caused damage in Tripolitania.

Cyrenaica appears to be more seismically active than Tripolitania. Scientists from the University of Texas at El Paso studied thirty shallow earthquakes originating primarily near the Cyrenaican uplift and occurring in the decade between 1990 and 2000.

In 1963 an earthquake destroyed Al Marj, the site of ancient Barce, between today's Benghazi (ancient Euesperides) and ancient Cyrene. In 1967 an earthquake affected the Jebel Akhdar region. In 1926 two earthquakes originating from the Hellenic Arc affected northern Libya, including Tripoli, Benghazi, and Darnah.

In Roman times, two large earthquakes (262 AD and 365 AD) destroyed most of Cyrene's temples and public buildings. These two earthquakes are Libya's earliest seismic events of record. The earthquake sequences in 365 originated in the Hellenic Arc, affecting not only Cyrenaica and the Gulf of Sirt but also Crete and other Aegean regions.

Given these records of earthquakes, I can comfortably presume that

Diodorus Siculus was correct when he said that an earthquake affected ancient Lake Tritonis in coastal Libya.

Sands of Time

In my reading, translations of Diodorus's account of an ancient earthquake suggest either one or two scenarios. In the first scenario, the sea can be said to have swallowed or engulfed the lake. In the second scenario, the land can be said to have swallowed the lake. In both cases, the lake would have disappeared from human sight, in the sense that it could no longer be differentiated as a discrete waterbody.

In the first scenario wherein the sea swallows the lake, perhaps the offshore reefs and sediment barriers which had created a lagoon environment were destroyed by the earthquake. Earth movements and turbulent waters from storms could have either breached or completely removed the barriers, causing the lagoon to lose its structure and become an indistinguishable part of the coastal sea. Coastal subsidence could have caused the lagoon to become permanently submerged.

In the second scenario wherein the land swallows the lake, perhaps the onshore bed of the lagoon was rifted or torn, causing the lake to drain down into subterranean karstic conduits.

In either case, after an earthquake caused the seaward part to disappear as a discrete waterbody, the inland part could have remained identifiable as a lake or lagoon until a drier climate and lower sea levels caused it to evaporate entirely. Or perhaps subsequent earthquakes continued to chip away at the underlying karst substructure until the inland region could no longer hold water.

After the natural drainage of Lake Tritonis, any evidence of the former lagoon would have been obscured by centuries of blowing sand and sediment, and perhaps by coastal subsidence as well. The lake literally was lost to the sands of time.