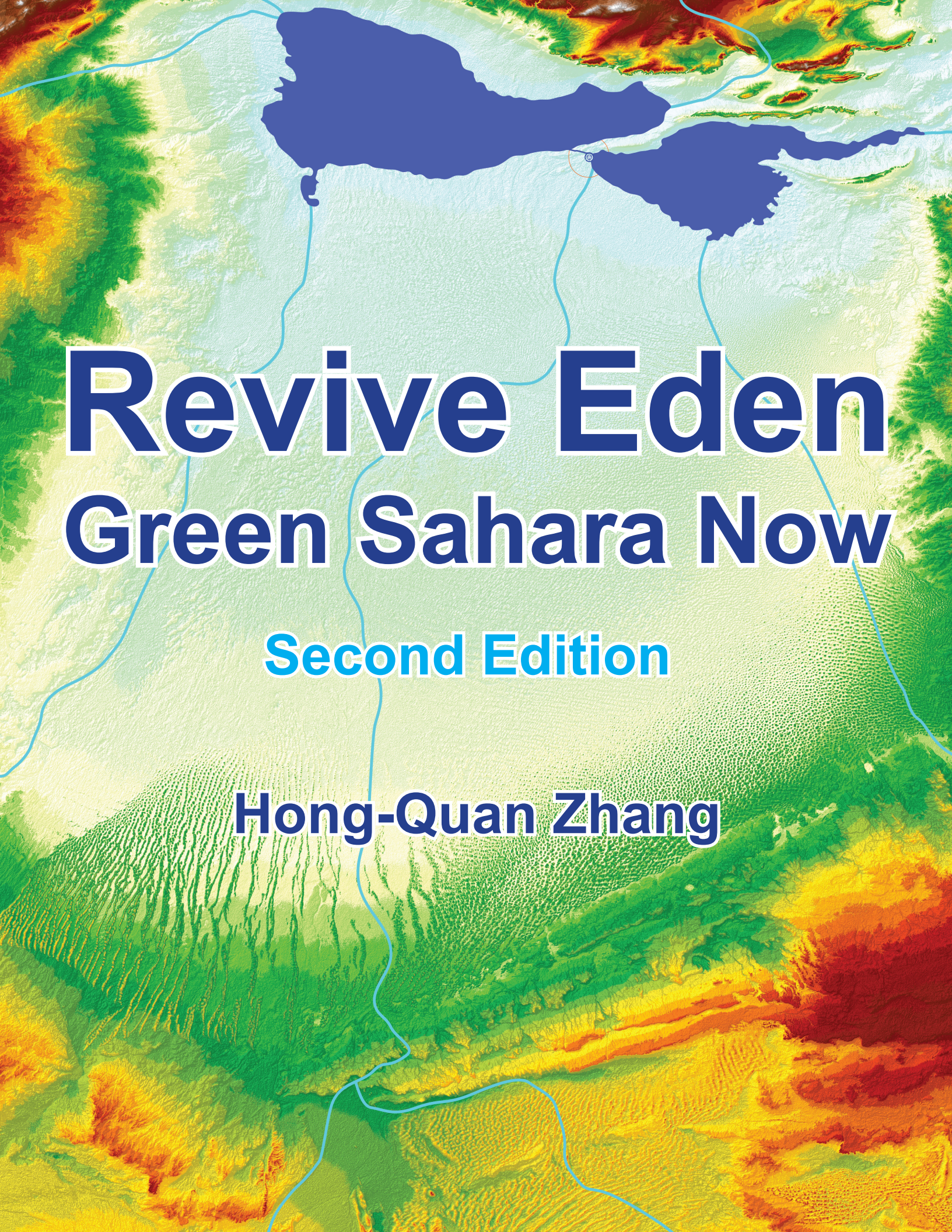

Revive Eden
Green Sahara Now

Second Edition

Hong-Quan Zhang

Revive Eden

Green Sahara Now

Second Edition

Hong-Quan Zhang

University of Tulsa

BookBaby

Printed in the United States of America.

First Edition: October 2019
Second Edition: April 2021

BookBaby
7905 North Route 130
Pennsauken, NJ 08110
www.bookbaby.com
877-961-6878

Table of Contents

Prologue – Back to Eden

Throughout my travels, for work and for recreation, I have visited and lived in various places around the world including Northwest China, Western Europe, the Middle East, the Western United States and my current home state of Oklahoma, which was devastated by the Dust Bowl not too long ago. I always marvel at the stark differences of water availability in these places, wondering what controls the balances and transitions. Six years ago, as a mental exercise, I calculated the amount of water required to convert a desert such as the Taklamakan Desert in the Tarim Basin in Northwest China to green land. This casual calculation led to an epiphany. I realized that Lop Nur (the terminal lake in the Tarim Basin) had acted as a stabilizer in ancient times for the humid ecosystem around the middle section of the Yellow River (now an arid place) that nurtured the Chinese civilization. With confirmations from historical records and climate data, I explained the aridification process and the control mechanism in a Chinese book published in 2017. This opened a door to a much bigger realm. I further applied the new understanding to the Sahara and identified the same control mechanism. The new findings and overwhelming evidence were published in the first edition of this book in 2019. While the messages are yet to be heard, the journey must go on, and now it has reached a key milestone – Atlantis.

Atlantis is not hiding at the bottom of the Atlantic Ocean but in plain view on top of the Sahara Desert. The prosperity of the Atlas Empire and the inundation of Atlantis corresponded to a lush Green Sahara started around 12,000 years ago. About 5700 years ago, the Green Sahara suddenly began to wither from the Atlas Basin, the heartland of the Atlas Empire. This is the rain shadow area of the Atlas Mountain range in today's Northeast Algeria and South Tunisia. When the water cycle stability in this standalone catchment was broken, the Chotts Megalakes (the Atlantic Sea) dried rapidly and the strong rain shadow effect of the Atlas Mountain became fully active. Deserts formed immediately in this area and gradually expanded east and south, like a spreading wildfire powered by the prevailing winds. This led to desertification and aridification in North Africa, West Asia, and the Mediterranean synchronously until this day. This timeline spans most of human history as we know it, including the thriving and dispersion of Atlas Empire, the rise and fall of Egypt, the prosperity and desolation of Mesopotamia, and the civilization shifts first from west to east and then from east to west across the Mediterranean and the Atlantic.

The Atlantic Sea had a surface area over 26,000 km^2, which generated a great amount of water vapor, sufficient to eliminate the strong rain shadow effect of the Atlas Mountain, so that the Green Sahara was stabilized for about six thousand years. The Earth's precession (wobbling) has been blamed as the main control for the flipping between desert and green in the Sahara. This view has misled the academic society away from seeking the true primary cause for so long. The water cycle stability of the Sahara is governed by the non-linear relationship between precipitation and evaporation, which depends on surface conditions and atmospheric circulation. The Earth's precession only moved the water cycle closer to its unstable point so that a perturbation could trigger the transition from wet to dry state. This book explains the start and step-by-step spread of the Sahara Desert and its impact on West Asia and the Mediterranean regions. Archaeological records and paleoclimate data corroborate this new insight of the Sahara expansion process and the consequential desertification in these areas. The desertification process in Northwest China is an independent validation for the same control mechanism. Based on the new understanding, approaches are suggested to revive the Northwest China ecosystem, to turn the Sahara back to green and to ameliorate Australia to a water abundant country.

Chapter 9 – Convincing Atlantis

…Sadly dispersed proud Atlanteans,
sweet homeland have you forgotten?
On God's promise the day is coming,
for a new earth and a new heaven.

– Hong-Quan Zhang, Feb 10, 2021

This chapter presents the finding of Atlantis – a joyful and destined encounter of my water quest. The historical account of Atlantis preserved by Plato is perfectly validated with the exact location, the timelines of climate changes, the hydrological process, and the geographical features. The fate of Atlantis is a vivid demonstration of how the Atlas Basin, the 'Eye of Africa' controls the giant water cycle over the Sahara, West Asia, and the Mediterranean regions.

The Atlantis Inundation

Climate Background

Atlantis is not hiding at the bottom of Atlantic Ocean but in plain view on top of the Sahara Desert. This is against all our common perceptions and probably the main obstacle preventing us from finding its existence. The rise and fall of Atlantis (or the Atlas Empire) were directly connected to the climate changes over the Green Sahara. Previously, the Younger Dryas (YD, c.12,900~11,700 BP) temporarily reversed the gradual climatic warming after the Last Glacial Maximum started receding around 20,000 BP. Corresponding to the short-term global cooling, the Sahara experienced a rapid desertification. Around 12,000 years ago, the Sahara quickly turned to green and lasted about six thousand years until 5700 years ago. Figure 9.1 shows the dust flux (normalized with low dust flux between 6-8 ka) changes obtained by McGee et al. (2013) and deMenocal et al. (2000) from the marine cores extracted at four different locations very close to northwest Africa coast from 19°N to 27°N (see locations in Fig. 9.2). At the immediate vicinity, this dust flux information accumulated on the sea floor clearly reflects the environmental conditions of northwest Africa, which set the climate background for the fate of the Atlas Empire.

From c.13,500 to 12,000 BP, there was a dust flux peak, about 3 to 9 times higher than the lower dust flux level during the Green Sahara Period (GSP) from c.11,700 to 5650 BP. This extremely high dust flux level indicates a desert condition in northwest Africa. It is debatable whether the GSP started earlier or at the same time of the YD ending. It is possible that the Sahara desertification and greening were leading the YD. Considering the dating uncertainties, this desert period may also be considered as the same time interval as the YD event. After c.12,000 BP and YD, temperature continued to rise. Being in the leeward area of the Atlas Mountain ranges, the Atlas Basin became warmer first, and the water cycle quickly switched from a desert 'insolvent' condition to a green 'affluent' condition (explained in Chapter 1). Climate data show that both flips from desert to green and from green to desert were abrupt, taking only several decades.

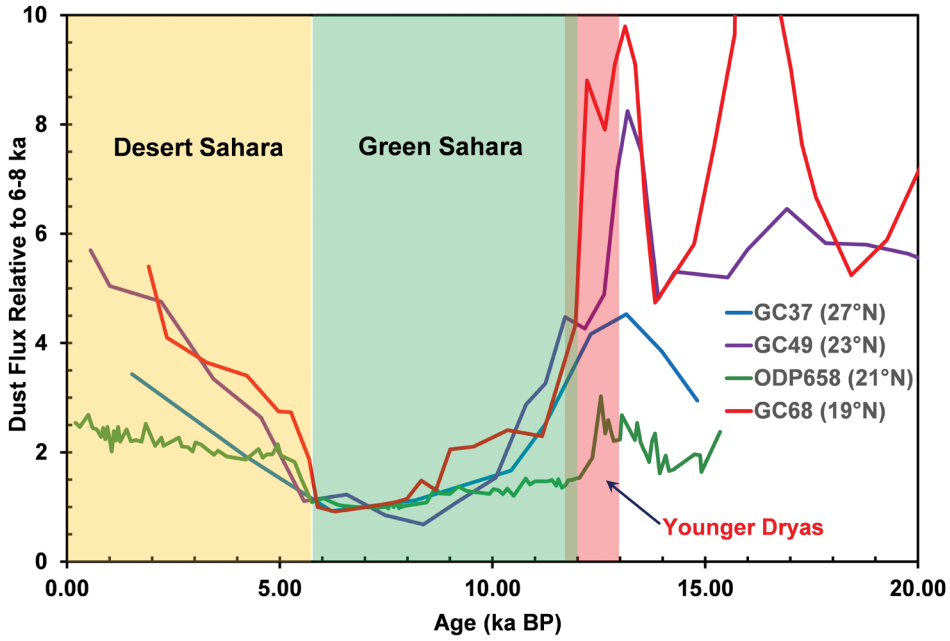

Fig. 9.1. Dust flux changes (normalized with low average between 6-8 ka) reflect environmental conditions for Atlantis (data from McGee et al., 2013 and deMenocal et al., 2000)

Plato's Critias tells: "Poseidon, receiving for his lot the island of Atlantis, begat children by a mortal woman, and settled them in a part of the island." Poseidon, the forefather of the Atlas Empire, was probably one of the first emigrants into the Atlas Basin after the area turned to green. Plato's Timaeus gives a very brief but accurate description about the location and size of the Atlas Empire:

> *…there was an island situated in front of the straits which are by you called the Pillars of Heracles; the island was larger than Libya and Asia put together, and was the way to other islands, and from these you might pass to the whole of the opposite continent which surrounded the true ocean; for this sea which is within the Straits of Heracles is only a harbor, having a narrow entrance, but that other is a real sea, and the surrounding land may be most truly called a boundless continent.*

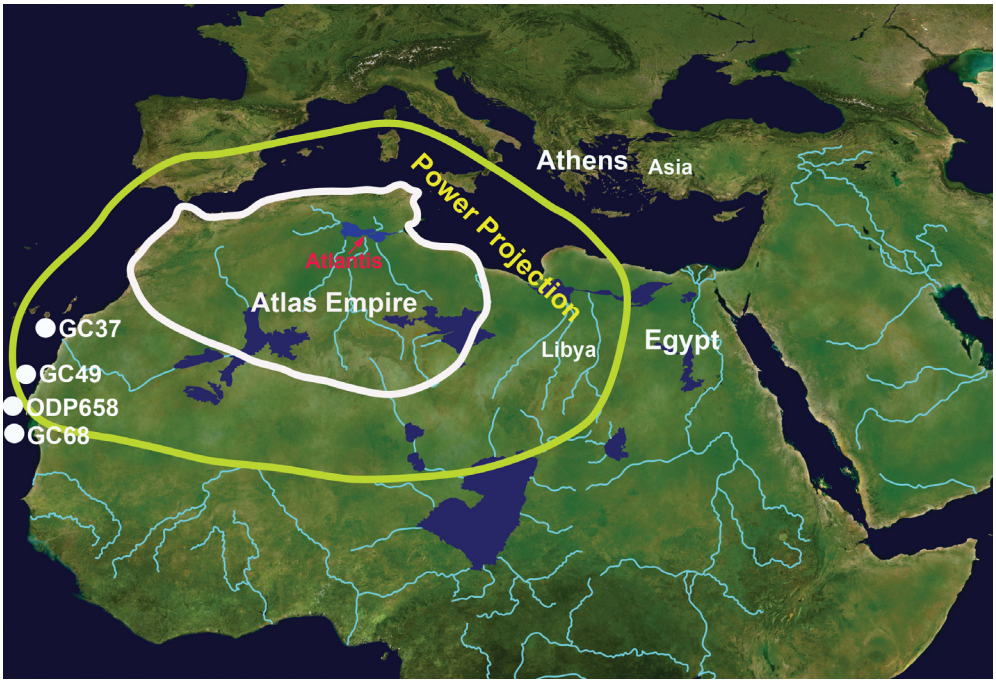

Fig. 9.2. North Africa and the Mediterranean at Atlantis time

Figure 9.2 shows the environmental condition and the powers at the Atlantis time. In recent history, the 'Pillars of Heracles' refer to the promontories that flank the entrance to the Strait of Gibraltar. However, Apollonius of Rhodes (Apollonius Rhodius) (c.270 BC) located the 'Straits of Heracles' in the Gulf of Gabes. The 'Straits of Heracles' was the ~100 km water way connecting the 'Atlantic Sea' to the Mediterranean Sea. The strait is confined by the mountain ranges on north and south sides (see in Fig. 9.3). Herodotus mentioned that the sandy ridge in west Libya extends to the 'Pillars of Heracles'. Aristotle (385-322 BC) writes that "outside the Pillars of Heracles the sea is shallow owing to the mud, but calm, for it lies in a hollow." This is not a description of the Atlantic that we know, which is not shallow, calm, or lying in a hollow and which he refers to as a 'sea' not an 'ocean'. Therefore, the 'Pillars of Heracles' must be the first highest mountain the Greeks and Egyptians saw when they looked to the west. The Atlas Mountain was regarded as the pillar of heaven. It is relevant that the Berber word for 'mountain' was 'adrar;' the Greeks may have modified this word to be Atlas to conform with their mythical giant.

About the size of the Atlas Empire, many scholars think Plato's description as an exaggeration when he says that Atlantis was an island 'larger than Libya and Asia together'. It meant a huge extent of land, but one wonders how the word 'island' was appropriate. Asia originally was just a name for the east bank of the Aegean Sea, an area known to the Hittites as Assuwa. Indeed, the area of the Atlas Empire was larger than Libya and Asia put together. It is surrounded by the Atlantic Ocean on the west side and the Mediterranean Sea on the north and east sides. This part of the African continent was likely viewed by the Athenians and Egyptians as an island or peninsula in prehistoric time. The empire was the way to other islands in the 'true ocean' we now call the Atlantic Ocean, which is surrounded by the American continents on the west side and Africa on the east. Comparably, the Atlantic Sea within the 'Straits of Heracles' was 'only a harbor, having a narrow entrance,' and 'the other (Atlantic Ocean) was a real ocean.' This 'narrow entrance' detail is very important to the fate of Atlantis, which will be explained later. The land (Africa and America) surrounding the Atlantic Ocean was said to be 'boundless.' All these descriptions are very accurate even by today's standard with satellite mapping.

Plato's Timaeus says: "This power came forth out of the Atlantic Ocean, for in those days the Atlantic was navigable." This description is very important about the meaning of the Atlantic. Why did the author emphasize 'for in those days the Atlantic was navigable?' It only meant that the Atlantic became unnavigable later. The Atlantic Ocean as we know today has always been navigable for at least millions of years. Therefore, the 'Atlantic Ocean' in Timaeus was not the Atlantic Ocean today. It was the Chotts Megalake in the Atlas Basin. We should call it Atlantic Sea. In classical Greek time, this water body was referred as Lake Tritonis which was considered the birthplace of Athene, the Greek Goddess of Wisdom, after whom Athens is named.

The Atlantic Sea was salty when it served as the terminal lake for the Atlas Basin without overflow to the Mediterranean Sea. When its water level was high enough to discharge to the Mediterranean, the east to west length was about 190 miles (300 km) and north to south width was about 75 miles (120 km). The water surface area was about 26,000 km^2. Standing on the high ridge above the lake a person would have seen a boundless water stretching to the horizon and would likely have thought he was looking at an ocean. Knowing that the Mediterranean Sea lay to the north may have created the illusion that the land was surrounded by water like an island (Rogers, 2018). About the power and influence of the Atlas Empire, Plato's Timaeus says:

> ***Now in this island of Atlantis there was a great and wonderful empire which had rule over the whole island and several others, and over parts of the continent, and, furthermore, the men of Atlantis had subjected the parts of Libya within the columns of Heracles as far as Egypt, and of Europe as far as Tyrrhenia.***

The heartland of Atlas Empire was the Atlas Basin surrounded by Atlas Mountain on north and west sides, and the Hoggar and Tassili n'Ajjer mountains on southeast side. Its influence reached far to the surrounding areas in the south, east, and north directions. There must be frequent exchanges of trade and culture between Atlas Empire and Egypt through the land of Libya. With ships and voyages the empire also engaged with people from the Mediterranean area.

Atlantis Location

In 1929, Paul Borchardt (1886-1953), a German archaeologist, claimed to have located Atlantis between the Chotts and the Gulf of Gabes in Tunisia. He related the names of Berber tribes to the names of Poseidon's sons in Greek mythology. He believed he had discovered Atlantean ruins at Qabes, but these ruins were later found to be of Roman origin. He informed us that Chott Djerid had also been known locally as Bahr Atala (Sea of Atlas). Hofmann (2005) supports the idea of Atlantis as a Bronze Age city located in North Africa. He believes that the Chotts in what are today Algeria and Tunisia originally constituted the lake Tritonis of Greek legend and was also

known as the Atlantic Sea and connected to the Mediterranean at the Gulf of Gabes, where the 'Pillars of Heracles' were situated. He also points to an ancient people, the Temehu or Tenehu who ruled North Africa up to the borders of Egypt, as Atlanteans and the ancestors of today's Berbers.

On January 29, 2021, I read Rogers' (2018) paper which drew my attention to the original Dialogues by Plato about Atlantis. The detailed and precise description completely matches the climate process and the geographical features I had studied for the same area. Once I finished reading Plato's Timaeus and Critias concerning Atlantis, I knew I had found the legendary city although I still was not sure about the exact location at that moment. I examined every speculated location, timeline, and cause of destruction in those previous pursuits. Although some are partially correct, due to the need of a complete understanding of the entire physical process the final revelation could not be reached. I started the new search based on Plato's direction in Critias:

> *Looking towards the sea, but in the center of the whole island, there was a plain which is said to have been the fairest of all plains and very fertile. Near the plain again, and also in the center of the island at a distance of about fifty stadia, there was a mountain not very high on any side.*

On Google Earth, I looked for the small mountain and specific surface features along the south side shoreline of the Atlantic Sea corresponding to the water level at Atlantis time. It only took about 20 minutes before I saw a crescent mark, part of the signature ring shape of the Atlantis, perfectly matching Plato's description in size and layout (see Fig. 9.4a). The exact position is 33°49'45"N, 7°43'50"E. The time was Feb 12, 2021, 10pm. Totally expected, and immensely surreal.

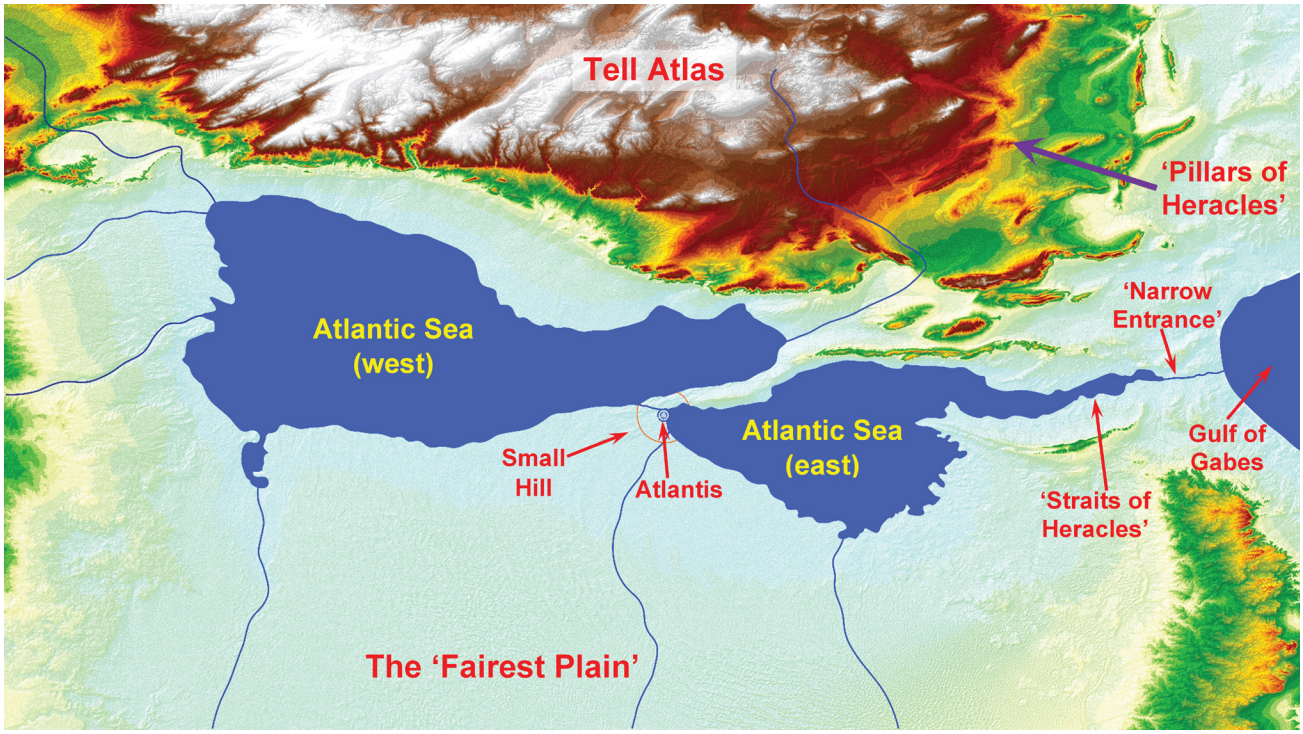

Fig. 9.3. The twin Atlantic Sea and Atlantis location

Figure 9.3 shows the exact location of Atlantis and the correspondent water area of the Atlantic Sea, which has two megalakes (west sea and east sea) connected through a canal passing the moat of Atlantis. The surplus water from the west sea flowed to the east sea which further discharged to the Mediterranean Sea if there was an overflow. South of the twin Atlantic Sea was the 'fairest plain.' The Atlantis citadel was located on the south bank of the man-made canal and to the northeast side of the 'low mountain (a small hill).' Currently on the southwest side of this hill is an oasis town called Hazoua. Atlantis occupied a key strategic position, controlling the water transportation and trade between the areas around these two seas. Near the south coast of the east Atlantic Sea, apparently the marshes were dredged as navigable canal for ship sailing and access. Atlantis served as the central harbor for water transportation between the 'fairest plain' and the north side of the sea and beyond to the Mediterranean Sea. On the land, Atlantis was also at the central point between west and east of the basin. This unique location was the key for Atlantis' prosperity.

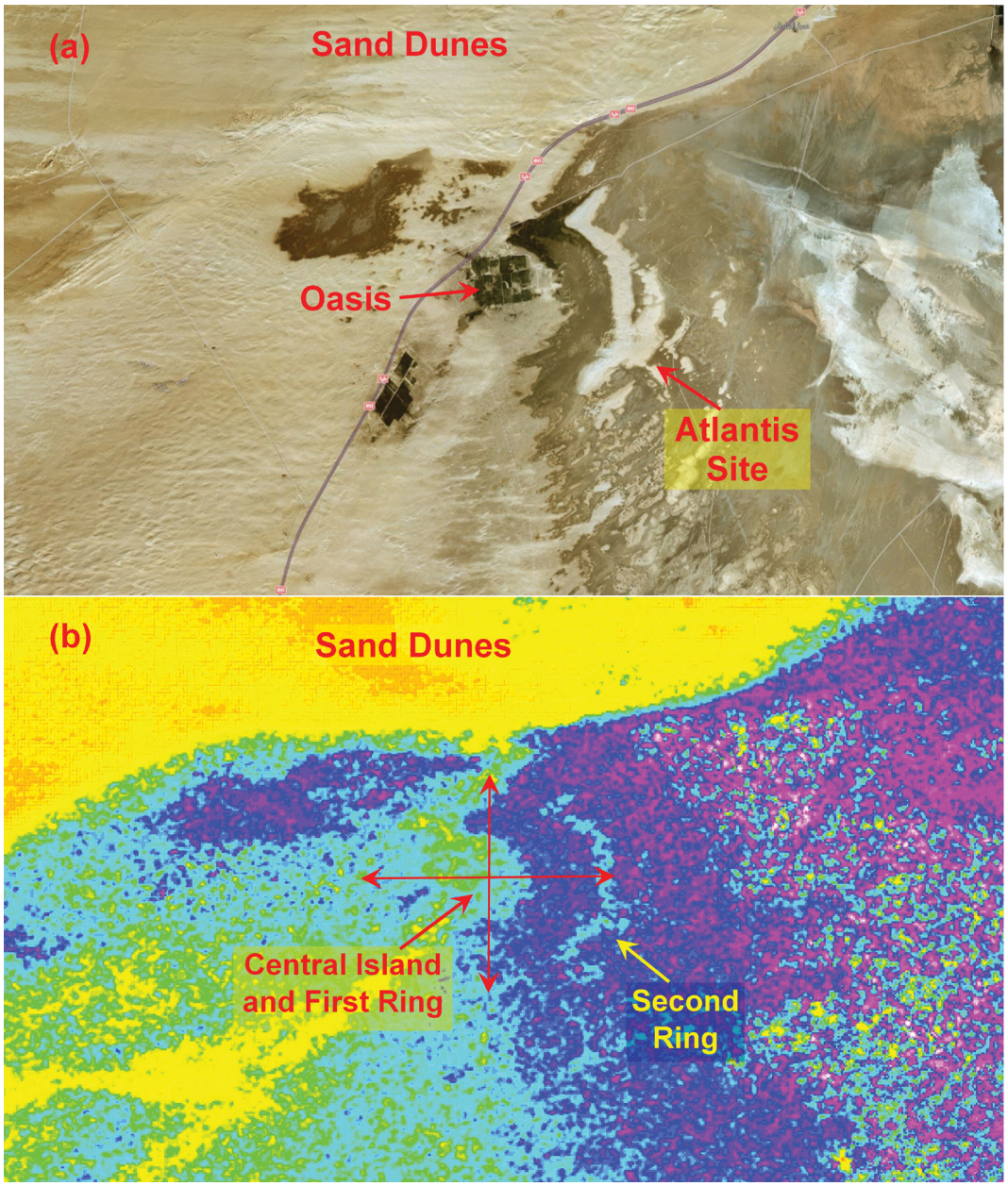

Fig. 9.4. Surface profile around the Atlantis site (The arrow marked diameter is 3696 m)

In Fig. 9.4, (a) is the areal image of the Atlantis site today from Zoom Earth, and (b) is the ground profile for the same area based on the Global Digital Elevation Model (GDEM). Amazingly, after more than ten thousand years of water and wind erosions, the surface profile of the citadel is still clearly visible, although partially buried under sand dunes. Apparently, the water way between the outer circular zone and the inner circular zone became part of the canal connecting the west sea and east sea after the inundation. The land contours were severely eroded by water flow and dredging. The central island is still clearly recognizable. Today, this part is still used to grow trees probably irrigated with ground water. Considering the washing by water flow for several thousand years and exposure to wind erosion for another six thousand years, nobody would expect any artefacts to be collected on the surface. However, buried in the citadel water channels on the shore side, there must be plenty of evidence to be found.

For distance measurement, Plato must have used the Olympic stadium, which is equivalent to 176 meters. Based on the records in Plato's Critias, the diameter of the Atlantis city is about 3696 m, with a surrounding moat about 528 m wide. The size of the outer zone marked in Fig. 9.5b is exactly 3696 m. The nearby 'low mountain' is so small that it would not catch anybody's attention. Today this small mountain measures only about 40 m above the surrounding area. It should be higher 12,000 years ago considering erosions by rainfalls during the wet time and

scratching by dusty winds during the dry time. Originally the Atlantis citadel area was part of this small mountain forming a ridge oriented from southwest to northeast. Due to stone quarries for construction of Atlantis, this part of the ridge was cut to a lower level. This detail matches perfectly to the descriptions in Plato's Critias.

The Ill-Fated Expedition

Despite the power and riches Atlas Empire had amassed, it met strong resistance from Athens and its allies when it tried to make a conquest. About this naval invasion, it was said in Plato's Timaeus:

> ***This vast power, gathered into one, endeavored to subdue at a blow our country and yours and the whole of the region within the straits; and then, Solon, your country shone forth, in the excellence of her virtue and strength, among all mankind. She was pre-eminent in courage and military skill, and was the leader of the Hellenes. And when the rest fell off from her, being compelled to stand alone, after having undergone the very extremity of danger, she defeated and triumphed over the invaders, and preserved from slavery those who were not yet subjugated, and generously liberated all the rest of us who dwell within the pillars.***

The war was between those who dwelt beyond and outside the 'Pillars of Heracles' and all those who dwelt inside them. The Athens brought freedom to all others living within the 'Pillars of Heracles.' From this statement, we can also draw the conclusion that the 'Pillars of Heracles' was not located at the Straits of Gibraltar. The naval defeat certainly withheld the expansion of the Atlas Empire in the Mediterranean area. Trades and cultural exchanges should have continued afterwards.

There was probably a weather factor in this naval defeat. The Atlantic Sea was an inland lake 'sheltered' by the Atlas Mountain ranges from north and west sides. The water surface was always calm and smooth, a perfect 'harbor.' However, the sailors and their ships might not be fully prepared for the much rougher Mediterranean Sea. In the New Testament Book of Acts, the Apostle Paul's companion Luke recorded a strong Mediterranean storm in the fall season: "We took such a violent battering from the storm that the next day they began to throw the cargo overboard. On the third day, they threw the ship's tackle overboard with their own hands. When neither sun nor stars appeared for many days and the storm continued raging, we finally gave up all hope of being saved (Acts 27:18-20)." The hurricane-like storm lasted at least fourteen days with their ship wrecked but the 276 passengers saved.

The most important factor in this warfare is perhaps the difference in the perspectives of the two sides. The Atlas Empire invaded to expand its influence and for slavery, but the Athenians was fighting for their survival and freedom. When a smaller power faces a live-or-die situation, it must fight the hardest and often defeats the bigger power. This has occurred repeatedly in history, such as the Japanese naval wars against China and Russia, and the British resistance against Germany during the First and Second World Wars in recent history.

After the Athenians and their allies demonstrated strength, probably a long-lasting peaceful time followed. At this time, the Sahara became fully green together with West Asia. Climate in the Mediterranean was also significantly improved, becoming warmer and more humid. Natural resources were abundant. People did not need to fight with each other for limited resources.

The Inundation

It is not clear how long after the naval defeat the inundation occurred, but it must be well into the Green Sahara Period (GSP), and the occasional heavy rainfall in the Atlas Basin could rise the water level of the Atlantic Sea to submerge the Atlantis in one day and one night, when the narrow outlet of the Atlantic to the Mediterranean was blocked by a landslide. Probably it was around 11,000 BP when the Atlantis inundation occurred. About the event and aftermath, Plato's Timaeus gives this description:

> ***But afterwards there occurred violent earthquakes and floods; and in a single day and night of misfortune all your warlike men in a body sank into the earth, and the island of Atlantis in like manner disappeared in the depths of the sea. For which reason the sea in those parts is impassable and impenetrable, because there is a shoal of mud in the way; and this was caused by the subsidence of the island.***

The European and African tectonic plates collide right across the Atlas Mountain and the Mediterranean area, with one plate diving beneath the other and into Earth's mantle. The collision accumulates great amount of energy, and this energy is released through earthquakes from time to time. This was exactly the cause of the 'misfortune' for both Atlantis and Athens about 11,000 years ago. A powerful earthquake caused widespread structure collapses

and massive casualties in the Mediterranean area. The consequent high tsunami submerged the coastal areas of Athens and other nearby countries, claiming more damages and human lives. This same earthquake also triggered a landslide at the 'narrow entrance' – the small outlet of the Atlantic Sea to the Mediterranean Sea – and blocked the water outflow. This blockage and the continuous inflow quickly rose the water level of the Atlantic Sea to a height that submerged the island city Atlantis. The water level rise was likely accelerated by floods from upstream rivers due to heavy rainfalls. The same earthquake might also have caused destruction of water infrastructures such as reservoir dikes and control gates, pouring great amount of water north to the Atlantic Sea.

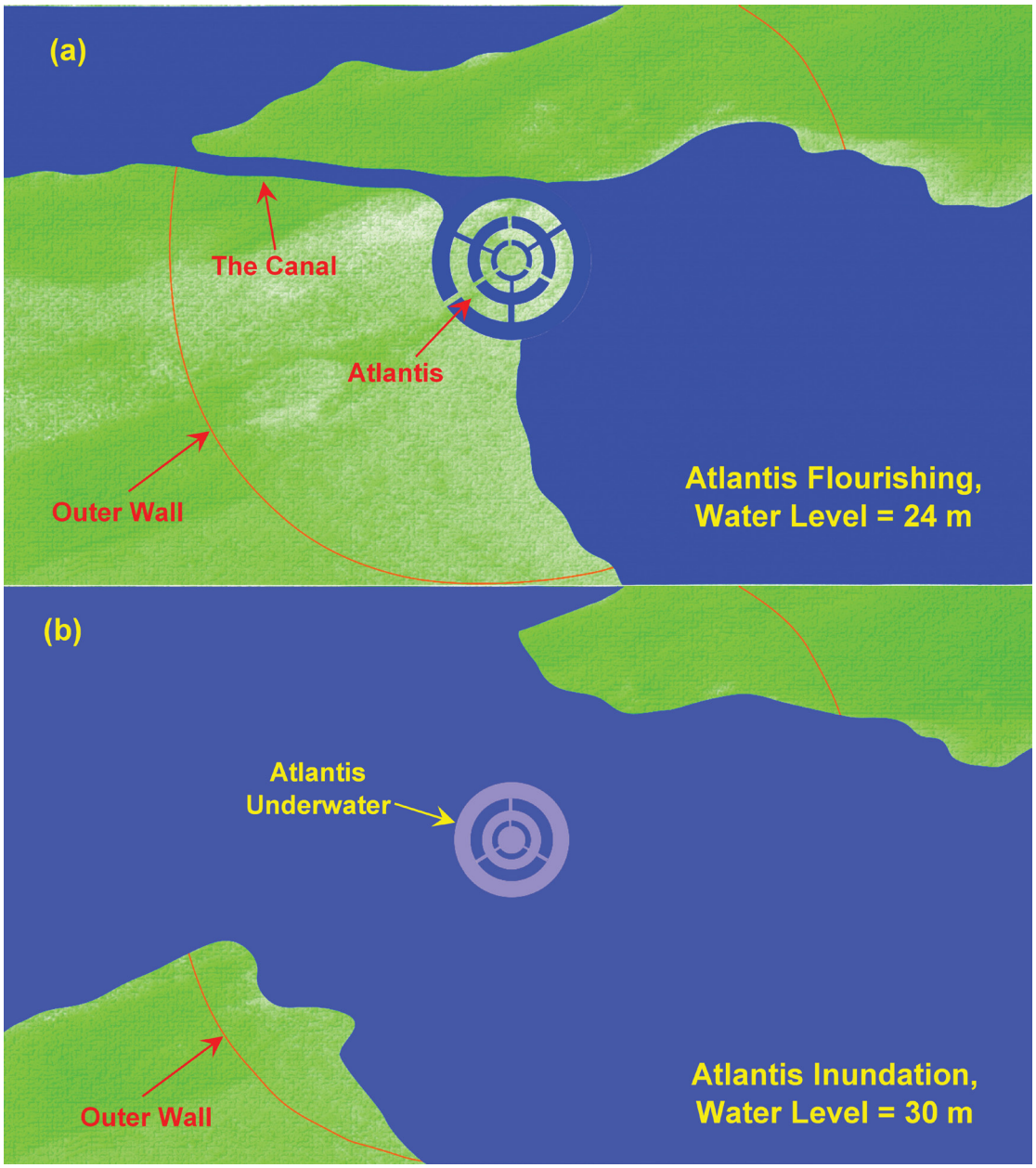

Fig. 9.5. Atlantis before (a) and after (b) the inundation

The Atlantis disaster is often interpreted as that the whole Atlantic Island sank to the bottom of the ocean. But Plato's Dialogue tells that 'the island of Atlantis disappeared in the depth of the sea.' It means an inundation of an island city instead of a tumbling of a continent or the entire island. Atlantis was submerged by rising water. The water level rise was about 5 to 7 meters. Figure 9.5a shows the land and water surface area around a prosperous Atlantis corresponding to water level 24 masl based on the present Earth surface profile. Figure 9.5b shows the same area flooded and Atlantis submerged by a water level of 30 masl. After the inundation, the citadel area became a muddy shoal only several feet below the water surface, making the area 'impassable and impenetrable.' This water area was the connection between the west sea and the east sea. The subsidence of the debris blocked the water ways

in and out of this area, making it difficult to identify a navigable path. This is probably the reason that the difficult navigability was mentioned multiple times in the record.

The 'Narrow Entrance'

The Atlas Basin is a standalone catchment. When the water cycle over this basin was triggered to an 'affluent' state (precipitation higher than evapotranspiration), the water level of the Atlantic Sea rose rapidly until it overflowed to the Mediterranean Sea at the Gulf of Gabes. The highest water level was corresponding to the lowest point of the Gabes Ridge between the Atlantic Sea and the Gulf, which was probably higher than 50 masl (currently about 45 masl). People must have realized that this outflow controlled the water level of the Atlantic Sea. Therefore, they dug the channel deeper to lower the Atlantic Sea level to about 24 masl, corresponding to the Atlantis time. Consequently, a very narrow gorge was formed which also spelt trouble for the future. Figure 9.6 shows the current ground profile at the narrow outlet corresponding to Atlantic Sea water level 24 masl.

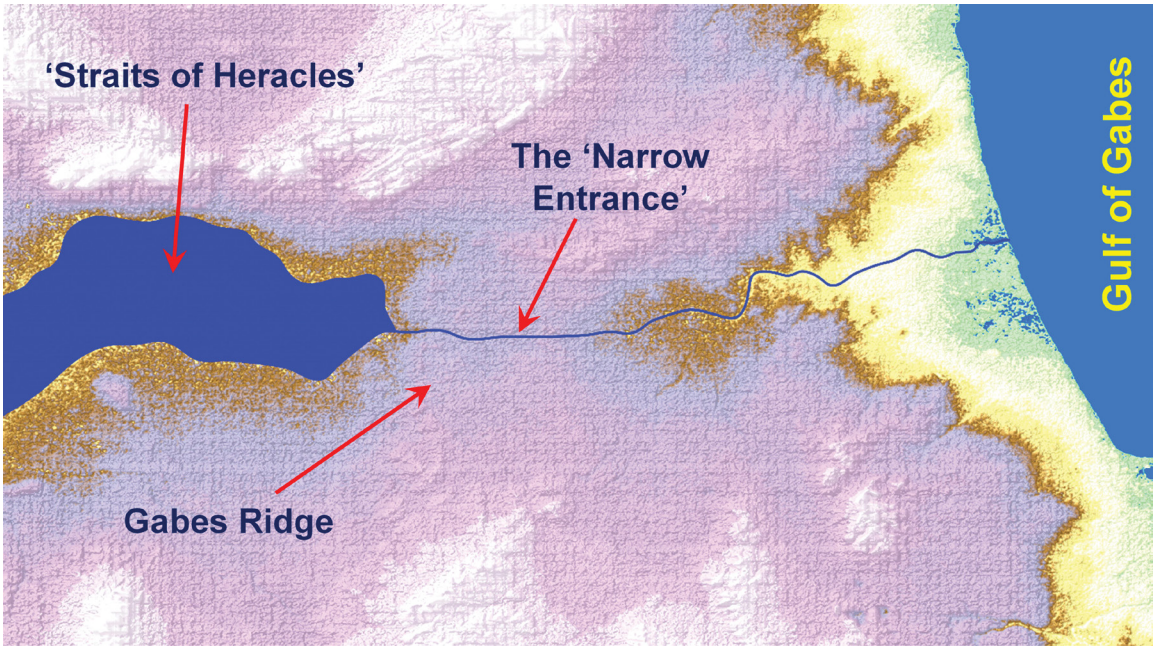

Fig. 9.6. Surface profile and outflow river at the 'narrow entrance'

It was possible during the Green Sahara Period (GSP) for a hurricane system to enter the Atlas Basin, like the severe storm the Apostle Paul encountered. In such a weather event, great amount of rainfall could be poured into the basin in a short time. The runoffs over the entire basin flowed to the Atlantic Sea, while the narrow outlet was blocked by a landslide caused by the earthquake, rising the water level so high that the Atlantis island and surrounding areas were submerged. The debris were soaked and subsided, forming muddy shoals. After the floods were over the water surface settled at a level higher than before due to the higher riverbed newly formed at the narrow pass. It was a natural disaster bound to happen eventually. The Atlantis inundation was not the end of the Atlantic civilization. Realizing that building a citadel on the water surface of the Atlantic Sea might not be the best choice under the threat of flooding, Atlanteans must have moved to a higher ground, and the civilization continued.

Dr. Heinrich Schliemann (who excavated Troy) made some wonderful discoveries about Atlantis which were published by his grandson Dr. Paul Schliemann (1912): "When in 1873 I made the excavation of the ruins of Troy at Hissarlik and discovered in the Second City the famous 'Treasures of Priam,' I found among that treasure a peculiar bronze vase, of great size. Within it were several pieces of pottery, various small images of peculiar metal, coins of the same metal and objects made of fossilized bone. Some of these objects and the bronze vase were engraved with a sentence in Phoenician hieroglyphics. The sentence reads: 'From the King Chronos of Atlantis.' Another article from the 'Treasures of Priam' is a bird sphinx also engraved: 'From the King Chronos of Atlantis' (photos of the vase and bird sphinx were presented)." Based on some other papyrus record (see 'Schliemann's Findings' in the last section of this chapter), King Chronos of Atlantis probably reigned the Atlas Empire c.8100

BP. This means that trades and cultural exchanges between the Atlantis Empire and the Mediterranean countries continued long after the Atlantis inundation.

During GSP which lasted about six thousand years, the Earth was a peaceful place, a paradise for animals. Facing the vast green Sahara, the Atlanteans must have gradually explored the new frontiers in south and east, meeting the newcomers from the sub-Sahara. The Sahara area was a true 'melting pot' for peoples from all directions.

The Leading Green

Atlantis Architecture

The small mountain where Cleito and her parents dwelt had likely been a desert oasis before 12,000 BP (during the Younger Dryas time). Water supply relied on springs. When Poseidon moved to this area, the desert had turned to green, and rainfall had resumed to normal level. The water surface area of the Atlantic Sea had expanded to its full scale and water overflowed to the Mediterranean. The water had changed from saline to fresh. The environment was booming. After falling in love with Cleito, Poseidon started to break ground and build his dream city – Atlantis, with a distinctive circular layered geometry which perfectly served the objectives of the design: "Poseidon…enclosed the hill in which she dwelt all round, making alternate zones of sea and land larger and smaller, encircling one another; there were two of land and three of water, which he turned as with a lathe, each having its circumference equidistant every way from the center, so that no man could get to the island, for ships and voyages were not as yet (Critias by Plato)." New technologies were quickly developed for ships and voyages. Poseidon and Cleito raised five pairs of twin male children. Each of them was given one of the ten portions of the land. The first born, named Atlas, was the first king, and the whole island and sea were named after him. This was the beginning of the Atlas Empire.

Atlantis was a true genius design, very effective in facilitating trades and transportations from sea to sea and between land and sea. At the same time, the multiple ring structure made the city perfectly defensible, with guards on watch, 'docks full of triremes and naval stores, and all things were quite ready for use.' On the islands of the city gradually built were splendid palaces and temples, pleasant gardens and even a racecourse for horses. The Atlantis was also a hub of self-inspired progressive technology development due to its mathematically beautiful geometry and versatile marine and land environment. Stone quarry tools and techniques were developed to meet the demand. The step-by-step gradual buildup was a perfect process for technology innovation and improvement. Plato's Critias says:

> ***First of all they bridged over the zones of sea which surrounded the ancient metropolis, making a road to and from the royal palace. And at the very beginning they built the palace in the habitation of the god and of their ancestors, which they continued to ornament in successive generations, every king surpassing the one who went before him to the utmost of his power, until they made the building a marvel to behold for size and for beauty.***

It also tells us that stones of different colors were used to please the eye. The colors are white, black and red. Satellite images show that the stone colors in the area indeed include white, black and red. In Tunisia, the sedimentary outcrop belongs to six different geological periods (Younes et al., 2014). This type of outcrop usually provides good quality building stones with different colors including white, yellow, black and red. Plato's Critias also informs us that two springs of water were brought up "from beneath the earth, one of warm water and the other of cold." Water was conveyed by aqueducts along the bridges to the outer cycles, an advanced water transfer technology used by different civilizations at much later times. In South Tunisia close to the Atlantis site, many artesian springs are still providing water supply to the oases. Some spring mounds are up to 25 or 30 m high (Roberts and Mitchell, 1987) due to long-time mineral deposition. The spring percolating from a deeper aquifer gives higher temperature than that from a shallower aquifer.

Flow of Wealth

Due to the unique and dominant power, trade, transportation and agricultural position, the Atlas Empire quickly accumulated tremendous wealth. The natural resources and environment fit very well to the description in Plato's Critias:

> ***…they had such an amount of wealth as was never before possessed by kings and potentates, and is not likely ever to be again, and they were furnished with everything which they needed, both in the city and country. For because of the greatness of their empire many things were brought to them from foreign countries, and the island itself provided most of what was required by them for the uses of life.***

A canal of about 10 km long was dug from the west sea to the city and it continued to the east sea (as shown in Fig. 9.5). The gate of each zone was large enough to allow the largest vessels into the city. An outer wall with a diameter of about 20 km (21,296 m) was built around the Atlantis citadel. Plato's Critias says:

> *The entire area was densely crowded with habitations; and the canal and the largest of the harbors were full of vessels and merchants coming from all parts, who, from their numbers, kept up a multitudinous sound of human voices, and din and clatter of all sorts night and day.*

What a prosperous scene in and around Atlantis together with the entire flourishing environment! It must be the envy of the world at the time.

The 'Fairest Plain'

In Plato's Critias, the descriptions of the land profiles around the Atlantic Sea perfectly match the land profiles we see today. On the north side the 'very lofty and precipitous' area is the south slope of the Tell Atlas mountain. On the south side:

> *…the country immediately about and surrounding the city was a level plain, itself surrounded by mountains which descended towards the sea; it was smooth and even, and of an oblong shape, extending in one direction three thousand stadia, but across the centre inland it was two thousand stadia. This part of the island looked towards the south, and was sheltered from the north.*

As shown in Fig. 9.7, the shape and dimension of the plain within the Atlas Basin we see today from satellite images are exactly the same as this record handed down from more than 10,000 years ago. The length of the plain in north-south direction is about 528 km (330 mi), equivalent to three thousand stadia. The width of the plain in west-east direction is about 352 km (220 mi), equivalent to two thousand stadia. The plain is sheltered by the Tell Atlas Mountain from north side. The Plato's book Critias has a vivid portrait of the majestic and abundant mountain ranges around the 'fairest plain:'

> *The surrounding mountains were celebrated for their number and size and beauty, far beyond any which still exist, having in them also many wealthy villages of country folk, and rivers, and lakes, and meadows supplying food enough for every animal, wild or tame, and much wood of various sorts, abundant for each and every kind of work.*

The lakes in the mountains were probably used to store water to be used for dry seasons. Critias says that the plain "was fashioned by nature and by the labors of many generations of kings through long ages." 'By nature,' it means that the plain is flat with a running down slope of about 6.5 cm per 100 m, perfect for both water flow and transportation. 'By labors,' it means that the magnificent canal network system was the result of continuous building up over many generations. The plain "was for the most part rectangular and oblong," exactly the shape we see today. It also implies that the fair climate was very stable for 'many generations', another evidence proving that the Green Sahara was lush and steady.

Plato's Critias gives detailed information about the ditch (or trench) around the plain, "falling out of the straight line followed the circular ditch." It means that the ditch on the south end was circular. Following its ends on the west and east sides were two straight ditches running north to the Atlantic Sea. Incredible details about the ditch continue:

> *The depth, and width, and length of this ditch were incredible, and gave the impression that a work of such extent, in addition to so many others, could never have been artificial. Nevertheless I must say what I was told. It was excavated to the depth of a hundred feet, and its breadth was a stadium everywhere; it was carried round the whole of the plain, and was ten thousand stadia in length. It received the streams which came down from the mountains, and winding round the plain and meeting at the city, was there let off into the sea.*

In Fig. 9.7 the purple line marks the peripheral ditch. Its total length is indeed about 1760 km (1100 mi), equivalent to 10,000 stadia. After many thousand years erosion and deposition, this man-made ditch is still clearly visible, which laterally cuts the runoffs from the mountain sides. The naturally formed gullies never go lateral and always wind down from top to bottom and merge with other streams to form a river. Inside the plain, smaller canals were cut at intervals of a hundred stadia and connected to the ditch. They were used to transport wood from the mountains and produces of the earth to the city. It is said in Critias that "Twice in the year they gathered the fruits of the earth – in winter having the benefit of the rains of heaven, and in summer the water which the land supplied by introducing streams from the canals." The water network must look like a spider web. Today most part of the plain are covered by sand dunes and it is difficult to identify the small canals on Google Earth.

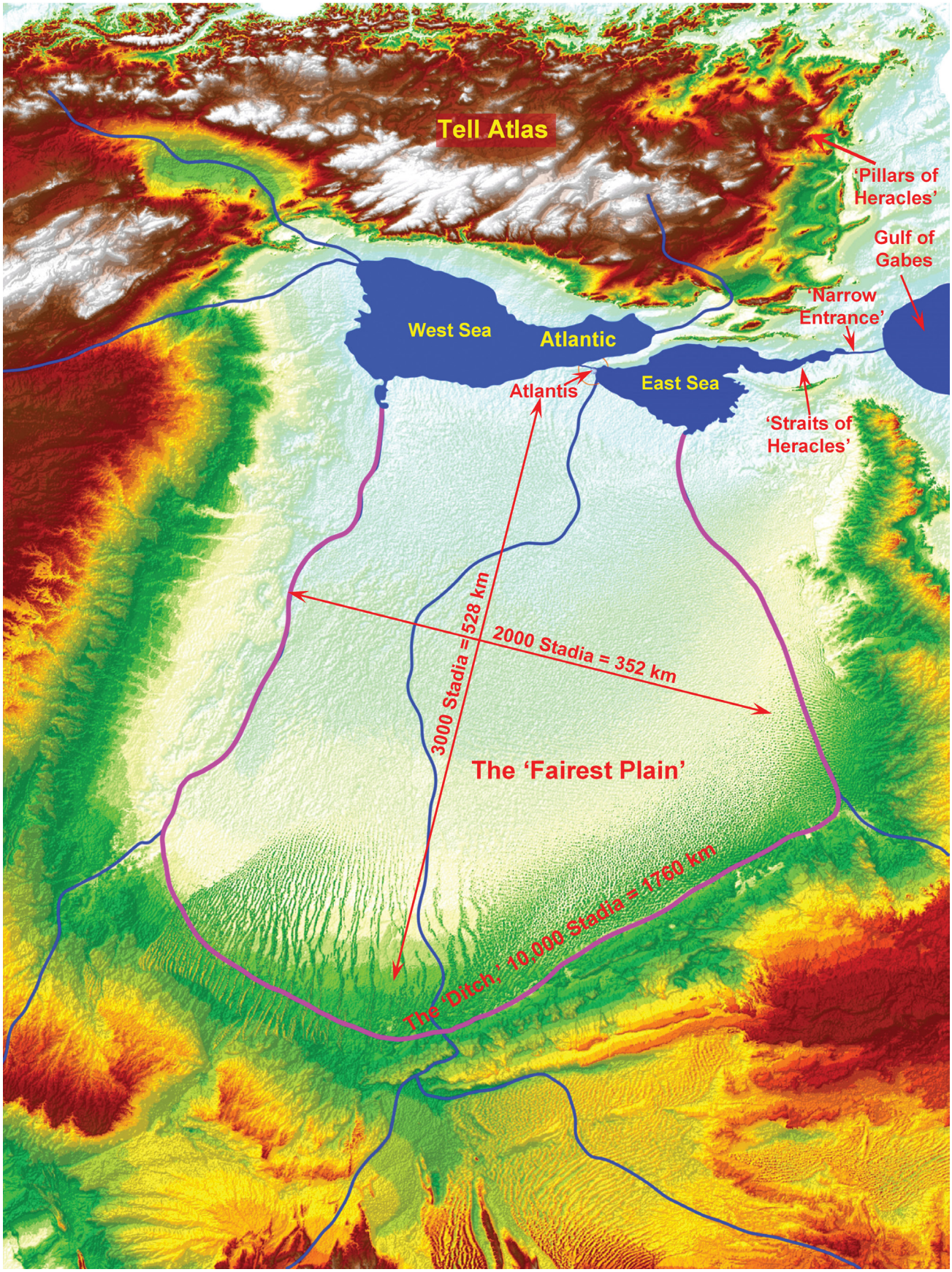

Fig. 9.7. The 'fairest plain' and the surrounding 'ditch'

Besides ship transport on water, the Atlas Basin was an ideal place to use chariots for land transportation and war purposes. The wide distribution of chariot paintings and engravings around the basin clearly agrees with the mentioning about chariot deployment in Plato's Critias: "The leader was required to furnish for the war the sixth portion of a war-chariot, so as to make up a total of ten thousand chariots; also two horses and riders for them, and a pair of chariot-horses without a seat, accompanied by a horseman who could fight on foot carrying a small shield, and having a charioteer who stood behind the man-at-arms to guide the two horses." Particularly the Algerian rock paintings show chariots with a seat and those without, those with only one person and those with up to three, exactly as Plato describes.

A Lush Paradise

The environment in the Atlas Basin was warm and pleasant. Many rivers flowed from the surrounding mountain ranges to the Atlantic Sea and further discharged into the Mediterranean. When the Atlantic Sea was full of water, its water evaporation was the eliminator of the strong rain shadow effect of the Atlas Mountain ranges. It provided stability to the water cycle over the basin. Due to its upwind leading position this water cycle stability further provided stability for the giant water cycle system over North Africa, West Asia, and the Mediterranean areas. During the Green Sahara Period (GSP), Atlas Empire was a true paradise, and the surrounding areas were also a wonderland for animals and hunter-gatherers. Plato's Critias tells:

> ***…there were a great number of elephants in the island; for as there was provision for all other sorts of animals, both for those which live in lakes and marshes and rivers, and also for those which live in mountains and on plains, so there was for the animal which is the largest and most voracious of all.***

Fig. 9.8. Numerous engravings and paintings of big animals found in mountains around Atlas Basin

Figure 9.8 shows the rock arts in the surrounding mountains depicting big animals including elephant, rhino, hippo, and giraffe. The great altitude difference from the basin to the mountains suits wide varieties of animals and different species of plants. Even at a much later time, elephants were a key part of the Carthaginian forces throughout the Punic Wars. Most of the elephants that were used by Carthage were Loxodana cyclotis, sometimes called African Forest Elephants, and were slightly smaller than African Elephants that inhabit savannahs today. African Forest Elephants were common in the areas around Carthage, so they were captured and trained for combat. There may have been up to 300 elephants in the stables at Carthage. Animal domestication is the most frequent portrait in the Sahara rock arts which echoes the practice of the Atlanteans. The excellent environment of the prosperous Atlas Empire is a great proof for the assessment made in Chapter 1 of this book about the lush

status of the Green Sahara. With all the above precise matches, how can we not be in awe and wondering about the tremendous details and flawless accuracy in Plato's records? The quality is no less than any of the modern documentations. How was this account preserved like a print for at least 10,000 years?

The Atlantean Dispersion

As explained in Chapter 2 of this book, the water cycle over Atlas Basin suddenly lost its stability about 5700 years ago. The water level in the Atlantic Sea quickly dropped to a very low level due to the feedback mechanism, and the water became brackish. The water vapor generated from this area became less and less, and the rain shadow effect of the Atlas Mountain ranges became stronger and stronger. This breach led a chain-reaction decline for the entire water cycle system in the downwind area. This initial abrupt aridification process in the Atlas Basin took only decades, a flash in geological time or even in the very short human history. With the sweet homeland quickly becoming desert, most of the Atlanteans were left no choice but to leave and move to other better environments, on a very short notice. This was an unprecedented Exodus. What was the society structure in the Atlas Basin right before the collapse? Did the confederation of kings survive to the end of the green period? This is a question to be answered by further archaeological investigation.

Rolling Boats Oversea

Although on the leeward southeast side of the Atlas Mountain the environment dramatically deteriorated, on the windward north side and west side the changes were relatively small. Some people probably moved to the other side of the Atlas Mountain ranges. Others could have moved higher into the surrounding mountain ranges where water was still available. Herodotus reports that the natives near the Atlas Mountain call this mountain 'the Pillar of Heaven'; and they themselves take their name from it, being called Atlantes. Atlas was a legendary king of Mauritania, the land of Mauri in antiquity roughly corresponding with modern Maghreb. With the rapid population increase on the windward side of Atlas Mountain, the local natural resources became stressful. People must find other places to move to. European continent is a good destination on the north side. Considering the influence and frequent trade over several thousand years, the Atlanteans likely found foothold on some islands and the Atlantic façade of Europe.

Fig. 9.9. Many Atlantis symbols found in Southwestern Spain and Portugal

On the southwest part of the Iberian Peninsula, more than 120 'Warrior Stelae' have been found in the last century. As shown in Fig. 9.9a, a typical three-ring pattern is thought to represent a shield or symbolize the sun. However, the V-shape opening on each ring is hard to explain. The original purpose of this symbol was very likely to represent the shape of Atlantis. The opening on each ring is the gate for ships to go in and out of the citadel. On the central island the dot probably represents the 'Temple of Poseidon.' This circular symbol likely served as a reminder to the people of their original homeland. The long object held by the figure on the left is thought to be

a sword, but from the huge size and position it might originally symbolize an oar instead of a sword. This symbol was probably used to identify the group as from the ancient kingdom of Atlantis by boats. The lower part of this stela (see Fig. 9.9b) depicts a chariot, another hallmark of the Atlantic civilization. The distinctive three-ring pattern gradually became a sacred symbol appearing in many rock paintings and engravings. It was later adopted as the V-notched shield motif during the Late Bronze Age by Tartessians and Celts from the same area. Koch (2009) finds numerous ancient Celtic place and group names in the western Iberian Peninsula, as well as language linkages between Irish and Tartessian inscriptions. He also points out that the Tartessian V-notched shields, leaf-shaped swords, and ogival-headed spears of the Iberian 'Warrior Stelae' have close counterparts among actual artefacts of the Irish Late Bronze Age.

Tartessos was one of the richest places for copper, tin, and silver. The Tartessian culture in southwest Spain is viewed as Atlantic, different from the Mediterranean culture such as Greek. When Herodotus wrote around 430 BC, the kingdom of Tartessos had ceased to exist and belonged to the pre-classical past before the rise of Cyrus the Great and the Persian Empire. Herodotus tells how the Phocaeans, Greeks in Asia Minor, were being threatened by the Persians, so they set out exploring in the West and they eventually came to Tartessos, where they were befriended by the King Arganthonios, who reigned for 80 years and lived to be 120. Arganthonios was sorry to hear that the Phocaeans were under attack from the Persians, so he gave them a large amount of money to build a wall to defend themselves. Some scholars think that the ocean-going, luxury-laden 'ships of Tarshish' mentioned repeatedly in the Old Testament refer to Tartessos. These texts talk about the trades going back to the joint venture of Solomon and Hiram I of Tyre around 950 BC. The 'Warrior Stelae' can be dated to a period just prior to Tartessos. Archaeologists have been puzzled with a question: If Tartessos was a distinctive culture, where did it come from? Now, with the finding of Atlantis, the answer is clear: there was indeed an 'Atlantic' culture rooted back in the Atlas Empire around the corner six thousand years ago. Naturally, the trading activities of Carthaginians and Phoenicians in this area could date to the Early Bronze Age, and they might also have picked up cultural elements from the Atlantic civilization.

The Turdetani of the Roman period are generally considered the heirs of the Tartessian culture. Strabo mentions that "The Turdetanians are ranked as the wisest of the Iberians; and they make use of an alphabet, and possess records of their ancient history, poems, and laws written in verse that are six thousand years old, as they assert." Strabo (writing c.7 BC) also records that "The Turdetanians ... and particularly those that live about the Baetis, have completely changed over to the Roman mode of life; with most of the populace not even remembering their own language anymore." According to Strabo's recording, the Tartessian language dates back more than 8000 years when the Atlantic civilization was at its zenith. However, the language was gradually dropped by some Tartessian ethnic groups during the Roman time.

The Minoan civilization was a Bronze Age Aegean civilization on the island of Crete and other Aegean Islands, flourishing from c.3000 to 1450 BC, shortly after the environmental breach on the land of Atlas Empire. It represents the first advanced civilization in Europe, leaving behind massive building complexes, tools, artwork, writing systems, and a massive network of trade. The Minoan civilization is particularly notable for its large and elaborate palaces up to four stories high, featuring elaborate plumbing systems and decorated with frescoes, similar as the details of the Atlantis architectures described in Plato's Critias. Trade concepts and networking were first developed and flourished in the Atlas Empire. The Minoan period saw extensive trade between Crete, Aegean, and Mediterranean settlements, particularly the Near East. Through their traders and artists, the Minoans' cultural influence reached beyond Crete to the Cyclades, the Old Kingdom of Egypt, copper-bearing Cyprus, Canaan and the Levantine coast and Anatolia.

Many Atlantis enthusiasts tried to draw an equivalence between Atlantis and the Minoan civilization and speculated that Atlantis as a Minoan coast city sunk into the Mediterranean by a volcanic eruption. Bull-leaping is a form of non-violent bull fighting based on an ancient ritual involving an acrobat leaping over the back of a charging bull (or cow). The sport survives in modern France, usually with cows rather than bulls; in Spain, with bulls, and in Tamil Nadu, India with bulls. Ritual leaping over bulls is a motif of Middle Bronze Age figurative art, notably of Minoan Crete, but also found in Hittite Anatolia, the Levant, Bactria, and the Indus Valley. It is often interpreted as a depiction of a rite performed in connection with bull worship.

Driving Chariots on Land

Anderson (2016) examined about 1200 depictions of painted and engraved chariots in Saharan rock art. Most of them are distributed in the mountains around Atlas Basin. Drawn by different animals, the extent and abundance of

chariot imagery indicates the vehicle had a considerable importance to a wide-ranging network of cultural groups. Technologically, in an environment that was becoming increasingly arid, the chariot itself may not have found its ideal niche, but the widespread imagery arguably attests to the symbolic aspects of chariot depictions possibly more than their functional use. If this is true, its origin might trace back to the long past in Atlas Basin.

The chariot is generally thought to have been introduced by the Garamantes, a cultural group descended from Berbers and Saharan pastoralists, who settled in central Libya from around 1500 BC. The Garamantes were skillful users of ground water for irrigation through a network of tunnels called foggara. If the Garamantes were the people to first introduce chariots to the Sahara, then one might expect most flying gallop chariot depictions to come from this core area. However, in Anderson's sample, Algeria has more than three times the number of flying gallop depictions (as shown in Fig. 9.10). A culture propagation from northwest to southeast would be a more reasonable interpretation.

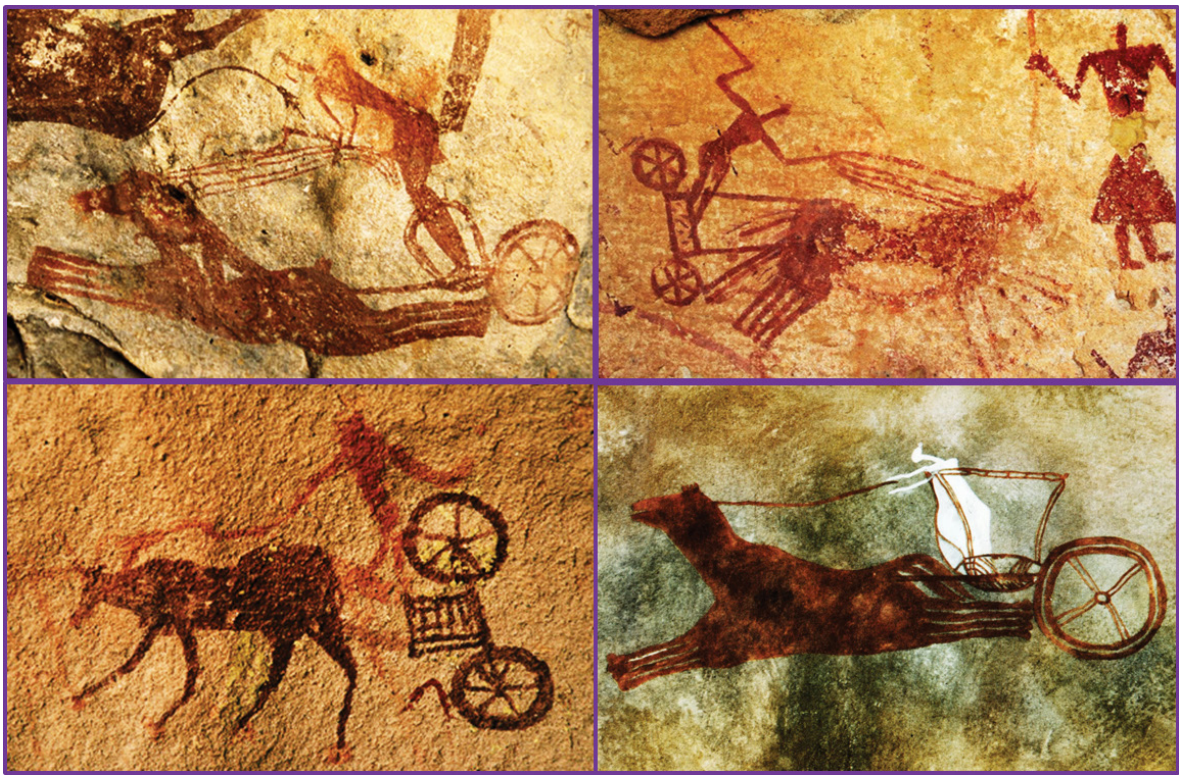

Fig. 9.10. Numerous chariot paintings and engravings have been found in rock arts near Altas Basin

Bull Sacrifice

The Atlanteans offered bull sacrifice to resolve transgressions in such a manner Critias by Plato:

> ***There were bulls who had the range of the temple of Poseidon; and the ten kings, being left alone in the temple, after they had offered prayers to the god that they might capture the victim which was acceptable to him, hunted the bulls, without weapons but with staves and nooses; and the bull which they caught they led up to the pillar and cut its throat over the top of it so that the blood fell upon the sacred inscription. Now on the pillar, besides the laws, there was inscribed an oath invoking mighty curses on the disobedient. When therefore, after slaying the bull in the accustomed manner, they had burnt its limbs, they filled a bowl of wine and cast in a clot of blood for each of them; the rest of the victim they put in the fire, after having purified the column around.***

There was a wide spread of a cattle sacrifice culture – animals buried in 'megalithic' stone structures – across the Sahara around the end of the green Sahara period (di Lernia, 2006). The type of rite – slaughtering of precious domestic livestock and bone burning – reveals a shared identity of the pastoral groups. At Messak Settafet, Libya (southeast corner of Atlas Basin), di Lernia and his colleagues found multiple sites with stone stelae and burnt cattle bones. Radiocarbon dating gives a time frame roughly from 5200 to 6200 BP. Across the Sahara some sites are as far as 3000 km apart from west to east, but they share strictly similar ritual.

In the most ancient times, Apis was a sacred bull venerated in the Memphis region in Egypt, served as an intermediary between humans and other powerful deities. Bull sacrifice rite is eminently typical of Egyptian religion, where it was regarded as the most acceptable of offerings. In Egypt, the King was presented as a deity, Horus, who hunts wild animals, including the wild bull.

Schliemann's Findings

Dr. Heinrich Schliemann, the German archaeologist and excavator of Troy, has contributed significantly to the pursuit of Atlantis (Johnston, 1946), but it seems that his findings have been widely ignored. Dr. Schliemann was quoted by his grandson, Dr. Paul Schliemann (1912), as saying: "I found in the Museum at St. Petersburg one of the oldest papyrus rolls in existence. It was written in the reign of Pharaoh Sent, of the Second Dynasty. It contains a description of how the Pharaoh sent out an expedition 'to the West' in search of traces of the 'Land of Atlantis,' whence '3,350 years ago the ancestors of the Egyptians arrived carrying with themselves all the wisdoms of their native lands.' The expedition returned after five years with the report that they had found neither people nor objects which could give them a clue as to the vanished land." This statement serves as a strong independent support to Plato's account of the Atlantis existence, location, timeline, and relationship with Egypt. Pharaoh Sent probably refers to Pharaoh Senedj (also known as Sened), whose reign was 2773-2753 BC. Therefore, the emigration of Egyptians' ancestors occurred c.8100 BP. This corresponds to the time when the Green Sahara was flourishing. However, when Pharaoh Sened sent the expedition, the Atlas Basin (the heartland of the Atlas Empire) had already become desert for about 1000 years. The Atlanteans had long left, and no traces could be found.

Another finding by Dr. Schliemann in Crete is closely related to the above papyrus record: "An inscription which I excavated at the Lion Gate at Mycenae in Crete recites that Misor, from whom, according to the inscription, the Egyptians were descended, was the child of Taaut or Thoth, the god of History, and that Taaut was the emigrated son of a 'priest of Atlantis, who having fallen in love with a daughter of King Chronos, escaped and landed after many wanderings in Egypt.' He built the first temple at Saïs and there taught the wisdom of his native land." Combined with the St. Petersburg papyrus record, this finding provides very important information about Egypt and Atlantis. It tells: 1st, who the first people of Lower Egypt were; 2nd, Thoth was not mythical but once a living man; 3rd, time frame of King Chronos' reign; 4th, time of trade between the kingdom of Chronos and Troy mentioned earlier; 5th, possible origin of the perfectly preserved Atlantis record from Thoth himself. The records on Atlantis were meticulously kept and handed down through many generations. It was a very old priest in the city of Saïs who told the Atlantis story to Solon. In his book 'Life of Solon', Plutarch says that Solon spent some time in intellectual converse with Psenophis the Heliopolitan and Sonkhis the Saïte, who were very learned priests.

There are some other historical notes reflecting the relationship between Egypt and Atlantis. Orpheus, a Greek philosopher, wrote: "In Chaldea the twin sister of Egypt, daughter of Poseidon, King of the lands beyond the sea and Libya." Herodotus mentioned: "The Egyptians boasted that their ancestors in the lands of the West, were the oldest men on earth." Diodorus informed us: "The Egyptians themselves claimed that their ancestors were strangers who in very remote times settled on the bank of the Nile, bringing with themselves the civilization of their mother country, the art of writing and a polished language. They had come from the direction of the Setting Sun and that they were the most ancient of men."

Transforming Egypt

The rise of Egyptian civilization closely follows the dispersion of the Atlas Empire. In the early days of Egyptology, it was thought that Egypt was simply a gift of the Nile. After the 1980s archaeological excavations in Egypt's Western Desert began to clearly identify the 'Saharan affinities' of the Predynastic Egyptians. Bárta (2010) suggests that Egypt received her intellect from western savanna/steppe societies. Dr. Renee Friedman, an Oxford Egyptologist, believes that Egypt and Nubia were also 'gifts of the desert' (Friedman, 2002). Plato describes Atlantis to have ruled Libya as far as to the borders of Egypt. That means Atlantis must have been located west of Libya, and Libya itself must already have been part of the Atlantean territory. With the gradual desert expansion from northwest to southeast, people living on the Sahara were squeezed to the Nile valley. Among them were many Atlanteans who then resettled in Lower Egypt.

The Egyptians divided the human race into four classes, namely the Egyptians, the A'mu (Semites), the Neh'esu (Nubians) and the Temeh'u (Temehu) in the country Tmh' (Libyans) (Bates, 1914). The Ancient Egyptians called the land and the people west of the Nile Valley the Tehenu, who appeared to be many groups, as attested by Egyptian references, such as 'the countries of the Tehenu' and 'the chiefs of the Tehenu'. But since the Temehu

were also referred to as 'the Westerners,' those who inhabited the area immediately west of the Nile, it becomes difficult to separate between the two Berber groups. Hence, according to Bates, the ancient Egyptians often did not always discriminate between the Temehu (Tmh') and the Tehenu (Th'n). These Berber groups were natives to the area since pre-dynastic times. Murray (1939) relates that the Temehu Libyans were employed in the labor gangs at the quarries; while other sources affirmed that the Temehu were famous for being skilled stone workers and that the monuments built of polygonal masonry in Cyrenaica were the work of the Temehu people who were often referred to as 'the Westerners.'

Both Egypt and Atlantis had divine rulers and confederations of kings with one supreme sovereign and many other smaller kings (governors) bound by a covenant. Herodotus states that at that time Egypt was divided into twelve districts with twelve kings over them. Both accounts highlight the concerted ritual action by the kings: they pour libations together. Herodotus locates this in the temple of Hephaestus (Ptah), though he adds that the kings met also in all the temples; Plato locates it in the temple of Poseidon and adds the detail of mixing the wine with clots of bull's blood. Both records also mention a sacrifice in the temple. The governing and administrative structure in Egypt was very similar as that of Atlantis. There are so many similarities between Egypt and Atlantis as portraited by Plato that Egyptologist Griffiths (1985) believed that Plato invented the Atlantis story based on the Herodotus writing on Egypt.

It seems that Athens, Atlantis, and Egypt share a common predestination. Athene was reportedly born at the Atlantic Sea (Triton Sea). Atlanteans was defeated in a naval conflict around 11,300 BP by Athenians. During and after the Green Sahara Period, Atlanteans frequently interacted with Egypt and other Mediterranean countries. Some Atlanteans settled in Egypt and helped create the Egyptian civilization. The Atlantis history was preserved in Egypt. Through Solon and Plato this history is faithfully handed down to us. Now Atlantis must convince the world about the powerful water cycle, so that these great civilizations will be revived together with many others.

Epilogue – Go Beyond

A healthy global water cycle is the answer to almost all the environmental challenges we are facing today, including the lack of clean water, widespread starvation, rising sea level, droughts and flooding, deforestation, desertification, species extinction, surging CO_2 emissions, and global warming. With the help from Atlantis, I hope the findings and proposals in this book would soon be adopted to achieve this goal: turning most of the arid regions of the world from water 'insolvent' to water 'affluent.'

The universe is a beautiful creation, and the Earth is a crown jewel. Upon seeing the gorgeous and fragile Earth the first time from the Moon, Alan Shepard (NPR Interview, 1994), the first American astronaut in space, could not help but shed tears wondering why "those folks down there can't get along together and think about trying to conserve, to save what limited resources they have." The white clouds glide through spacious skies; they deliver seasonal snow or rain over majestic mountains and green plains. The blue oceans receive shining sunlight; they offer water vapor to winds and receive runoff from rivers. The vibrant and versatile climates of Mother Nature have helped shape humans and civilizations. However, majestic mountains and strong westerlies together also form rain shadows which set up dry conditions for deserts to spread, like a cancer invading a healthy body. The good news is: God has already prepared the remedies, such as the Atlantic Sea for the Sahara and Lop Nur for North China. All we need to do is to put them to work and the water cycles in these regions will become healthy again.

Greening the Sahara will need support and collaborations from stakeholder countries in North Africa, West Asia, and the Mediterranean. This will serve as a natural bond to foster peace and prosperity in the world. People will realize that we depend on each other through an invisible water cycle. Together we all win; and divided we all lose. The quality of our own lives relies on our kindness to others. There will be cultural revivals from the soils that nurtured great civilizations including the Atlantic, Egyptian, Sumerian, Harappan, Nubian, Babylonian, Assyrian, Hittite, Persian, Greek, and Roman. The Sahara and deserts in West Asia can be ameliorated back to the fertile homelands to which the dispersed peoples long to return. This book presents a completely new approach for solving aridification problems around the world. Accordingly, optimized solutions can be found to turn most deserts to green plains in concert with the global water cycle. The current climate in humid and sub-humid regions around the world will also be greatly improved due to the moderation.