**Maritime History of the Mediterranean Sea**

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***The Land divides, the Sea connects***

Homer

Summary:

* The Mediterranean shore cultures have been the incubator of many of the processes of the modern world, from religion and art, to commerce and technology.
* Vessel and ship construction to fish, coast or cross the Mediterranean for trade and war has been a driving force of cultural interchange and development.
* A cycle of exploration, settlement, trade, piracy, naval protection, imperialism and imposed sea ‘pax’ has continued from the earliest history to the present.
* The speed of travel at sea has grown, shortening this cycle until the current age of rapid transport, instant communication and global trade.
* Human impact on the sea and marine life has been most severe in the Mediterranean. Awareness and research in this has been overwhelmed by coastal industrialization and population growth.
* Will the Mediterranean lead the world in peace and environmental science, preservation, restoration and cultural cooperation or continue in the long path of nationalist and religionist conflicts and ecological degradation?

***Caelum non Animum Mutant Qui Trans Mare Currunt***

Those who hurry across the sea cannot change their soul - Horace

This sea between the lands, this middle of the earth, this ‘Great Sea’ to the Hebrews, ‘Green Grass Sea’ to the Egyptians, ‘Our Sea’ for the Romans, and ‘Lake of Civilizations’ for historians is an ever present dynamic hydrography amidst the complex active geography of the region. The peoples of the Mediterranean are similarly a mix of cultures, languages and destinies evolving from antiquity to today along the shore. Change is the only true constant even in this most ancient of land and sea scapes. The geography of the Mediterranean made North South East and West contacts par course once the means for sea travel were invented. Without ships, we would still be local farmers and gatherers looking at the sea as an impassable barrier.

The first people to cross the waters of the Mediterranean may have been later Cro-Magnum hominids who rode logs or rafts to visible isles or across bays. The earliest depictions of a boat is a model found in a tomb in Italy from ~ 6000 BCE. No such early archeology of an actual craft has yet been found, and is unlikely as sea levels have risen over broad reaches of formerly dry ground. The Gibraltar caves of Neanderthal people once looked out over a distant shore. Other islands off Sicily and in Greece have been inhabited for over 10,000 years. Malta has the world’s oldest megalith temple structure, older than any in Egypt, and is still a mystery as to their builders. Were the earliest of homo sapiens safer offshore than exposed to predators on the mainland? Have early humans been driven to sea by curiosity or desperation?

Mythology holds clues to the pre-history of the Mediterranean. Jason was the primordial adventurer who sailed far away to pursue an ideal. His ship the Argo was built with unsinkable woods and blessed by Diana. His 50 sailors were of heroic stature and strength. They sailed through unknown seas to the coast of the Black Sea to find the Golden Fleece. Their journey took them all the way around Europe returning via the Gates of Hercules and back to Iolcus to confront King Pelias to claim his father’s throne. This spirit of questing is at the soul of later journeys by explorers who expanded the knowledge of the Mediterranean and beyond. (Note to sailors: Jason is said to have died when he fell asleep in the shade of his ship the Argo, which was so rotten, it collapsed on him. Never nap under old timbers!)

This mythology bonds the natural world with human imagination in order to comprehend forces beyond human control. The post Ice Age era flooding of the Mediterranean - when the Atlantic broke through the Strait of Gibraltar to fill the dried sea valleys of the Mediterranean - may have been a primordial human memory recounted for generations until written as the tale of Noah. Certainly any prehistoric human settlements along the earlier shores of the Mediterranean have been long flooded as sea levels rose over millennia.

The Mediterranean is especially fearsome when tempestuous, a sea that turns from a lovely lake to kick up in short period high waves that readily capsize small boats. Thus many a sailor or fisherman was lost in short time with no chance of survival. Some lucky washashores claimed to be saved by dolphins or mermaids. For better luck, various sea deities were worshiped and offerings made to ensure safe journeys. The glass blue ‘eye’ that graces all Greek and Turkish vessels provides vision in bad weather and helps ships find their way.

Poseidon aka Neptune still rules over sailors’ imagination when they first cross the Equator in ‘Line Crossing’ ceremonies at sea where novice ‘pollywogs’ are hazed and turned into veteran ‘shellbacks’. The Poseidon temple at Souinon on the Attic Peninsula remains as a gleaming marble beacon to ships returning to Athens. Here King Attica cast himself off the cliff into the sea when he saw Perseus’s ship returning from Crete with black sails. His son who had battled the Minotaur forgot to hoist white sails of victory to the dismay and demise of his waiting father. (Note to young sailors: Call home before you arrive!)

There are no atheists in a sea storm, when God is often invoked if not cursed. Jonah may have been naturally swallowed by a whale, but his salvation was said to be divine. St. Elmo, the patron saint of sailors, is honored with the static electrical charges on ship’s rigging - St. Elmo’s Fire - considered a blessing for a safe passage.

Beyond religion and superstitions, modern mythology has its place today. The images of leisure impede upon the minds of millions: royals and media celebrities (slob-rities) lounging on beaches, mega yachts hosting bacchanalia… The illusion of escape from land crowds and economic concerns is the modern Mediterranean fantasy. In post religious Europe, pursuit of pleasure is the gospel of the masses.

No one knows who first realized water displacement – the phenomenon of a contained vessel floating in spite of the weight of the container. Rafts merely floated, but could not carry much load safely. At some point boats were built to carry heavy loads. Archimedes realized the principle of displacement in his famous bathtub realization, spilling water over the rim. But who took this insight into boat construction? It was long before the literate description of the act in the bath. This simple *Eureka!* is perhaps the most important item of human understanding of hydraulic physics, allowing our terrestrial-ness to float and venture afar.

The invention of the ax and chisel in the Bronze Age made simple boats then larger ships possible. A millennium of piecemeal improvements in boat construction led to sea voyages. Coastal pilotage into the dark led to cross sea voyaging one starry night. As the heavens made directions clear to some observant sailor, the age of celestial navigation began one brave night. The vast and foreboding Mediterranean Sea became a mere lake to cross, weather permitting.

Egyptian and Hittite records have a hieroglyph for the ‘Sea People’ – a sail-like figure. These people were recorded as ferocious raiders from Cyprus to the Levant & Egypt. They may have been forebears of the Pheonicians, though they left no language nor archeology yet found. But all pirates need a base and homes. New discoveries may yet push back the historic record into an earlier era. Certainly those people who could master boat construction and navigation had a distinct advantage over land peoples to traverse long distances and find new resources. The parallel development of weaponry would give another advantage to the various sea peoples that lived around the Mediterranean.

The Pheonicians built port cities at Tyre and Sidon and developed the first long range trading vessels with sails and large banks of rowing galleys. Their widespread establishment of colonies along the shores became the first global trade network. Pursuit of the murex dye of the cochineal shellfish off Morocco led to the regular passage out the Gates of Hercules now know as the Strait of Gibraltar. It is not an easy sail, as wind contrary to currents caused many a little ship to founder and be lost. This ‘royal purple’ dye became a prized commodity for centuries. That the source of murex was so far away from its market impelled the design of larger ships and nautical knowledge. Many followed out into the Sea of Perpetual Gloom – as per Herodotus – that was the Atlantic, as the treacherous exit from the Mediterranean became the doorway to the world. A comment in the Book of Daniel as passed into Latin reads: Multi pertransibunt, et augebitur scientia” – “Many pass through and add to knowledge.”

The details of the Pheonician society are limited due to lack of direct sources in their language. Yet the phonetic alphabet they created has become the basis for most script in the European world. Greek, Latin, Cyrillic and the variations of letters in modern languages are all decendants of the Pheonician alphabet, becoming a *scriptum franca* of the Western world. Exceptions to this common linguistic heritage are Hebrew and Arabic, and the various Semitic scripts. Is the fundamental difference in written language a factor in centuries of conflict between these cultures?

Other innovations have had a more pervasive benefit. Standard weight measures made surety of quantities among distant markets. We inherit versions of the cubit and ounce. Metal coins, as unit for trade, were a Pheonician invention, the first shekel. Credit, literally ‘belief in the spoken word’, the confidence in assured payment and its accounting were also spread across the trading colonies, allowing the exponential growth of trade. These led to banking and investment, the multiplication of value. Without these, the world would still be at barter.

No records of the Pheonicians sailors remain to detail their ship design or navigational techniques. But these were likely passed down to the Egyptians and Greeks, however adapted to their own uses. The Mycaenian Greeks who settled in the Levant at Eskatlon were sea traders back to the Aegean leading to generations of sail galleys plying the eastern Mediterranean. The trade and populations grew, with islands having access to the mainlands by ships. It became routine for seasonal sailing across the Aegean and beyond, avoiding all the dangers of land travel, more dangerous for a traders goods than most storms and rocks. As Homer commented, “The land divides, the sea connects.”

The development of shipping economies produced the ‘thalassocracies’, maritime based city/nations: first Pheonicia then Alexandria, Venice, Constantinople, Genoa, Barcelona, Algiers, Marseilles, Dubrovnik and numerous smaller ports. These gateways to the wider world became key economic centers for the nations that developed inland. Even more sea based are the island peoples of Crete, Rhodes, Cyprus, Malta, Sicily, Sardinia, Corsica and the Balearics. These islands have always been in conflict with the imposing forces of the larger mainlands. After centuries of conflicts, only one of these isles – Malta - is independent today.

A key tactic of war became the blockage of ports. Thus many ancient cities were ringed with defenses and fortified harbors. Marseilles is a fine example with a narrow gap into the Vielle Port, which dates from Pheonician times. No ship or attackers could pass the fort St. Michel without peaceful intentions.

Egyptian traders sailed the Red Sea and likely to the Persian Gulf and perhaps to India. The ships are depicted in many relief carvings. The only extant vessel is the great funerial ship at the Cheops pyramid at Giza. This 30 meter wooden galley was built and encased as a means for the Pharoah to journey in style to the afterworld. It was not seaworthy, yet showed the planking and oar sets of boats of the era along the Nile and Red sea. Subsequent development of hull design led to the sturdy *golloi* of the Levantine traders and longer, faster war galleys.

The subsequent evolution of Nile feluccas and coastal dhows follow in this style, with sewn planking and wax and wood shaving as caulk. The triangular lateen sail rig hoisted on a single mast hauled to a forward point allows the ship to sail up into the wind. This simple rig would not be adopted by northern Europeans for a thousand years after used in the southeast Mediterranean. Today this rig, now called Marconi, is adapted as the standard for modern sail boats.

The forests of the Mediterranean coast began to fall for ever more ships. Today less than 10% of woodland survives, and that is stunted regrowth. Later generations of carpenters and shipwrights would need to bring timber from afar, very far. The demand for suitable ship building supplies was in itself an impetus to extended trade routes. The Canary Islands were stripped bare of their fine indigenous pines for the ship building across the Western Mediterranean. Timber supplies from Scandinavia and the Americas finally replaced the depleted resources of Southern Europe. To this day, large wooden boats up to 30 meters are assembled in high mountain areas of Turkey and trucked to the sea, in an inverse of the journey of Noah’s Ark.

Essential nautical knowledge was a product of the active minds of ancient Mediterraneans, Archimedes describing phenomenon put to practical use. His water screw principle now drives myriad ships via the propeller.

Other ideas have become the basis of our nautical heritage: Sail rigging with blocks and line developed in various places to handle the varying winds for propulsion. Coastal traders packed amphorae with oils and wine safe below decks clear of the sails. Mechanical advantage was key to rigging larger vessels. Roman freighters carried 400,000 tons of grain from Egypt every season. Wine carriers held clay tanks for 800 gallons. These freighters of the empire needed the elementary cranes and tackle to be efficient.

Offshore navigation depended upon careful observation of the stars to determine latitude. The Arab *kamal* – guide - sighting device consisted of a string with a block of wood. The string was clenched in the teeth with the wood raised to join the sighted star and the bottom the horizon. Thus a measure of the declension of the celestial sighting was made giving a rough measure of latitude. Later devices utilized rods with sliding parts, leading to the sextant with its optical addition. Mediterranean navigation used these techniques in measure, as coasts were never more than a few days away, but these techniques would become invaluable for navigation in larger oceans. The Arab astrolabe would become the first mechanical calculator at sea.

Cartography developed along with navigation science to record the experience of the sailors who led the way to new ports. Hipparchtus postulated the lines of latitude and longitude that became part of the Ptolemaic measures of the earth. Greek *periplus* pilotage books described courses for destinations. Agarthermos wrote “From Paphos to Alexandria is 3800 stadia with Boreas,” the port of southern Cyprus being about 300 nautical miles following the northerly wind. The most famous of the *periplus* describes routes beyond the Mediterranean to the Red sea and India. After the compass was adopted, rhumb lines were drawn on sea charts between headlands and ports. The folios of these sailing directions became the *portolanos* prized as essential to navigators and state secrets to competing nations.

The compass – know in Italian as the *buscolo*, the seeker – came to the Mediterranean via the Arabs who brought the device from China. This floating lodestone in the form of a spoon was originally used for *feng shui* geomancy. When applied to navigation, the stone floated unstable in the waves and was refined to a needle poised on a shaft. The Chinese still refer to the compass as the south pointing spoon, south being the cardinal direction for Asian sailors. The compass was passed along via the Indian Ocean, first mentioned in a document by Alexander of Neckham in Paris in 1180. The Arabic compass name, *al konbas,* is perhaps the origin of the European name, though it not known which language named the device first. In the early 1300’s traders brought the compass to Amalfi Italy. There, Flavio Gioja was later credited as placing the compass plate and wind rode indicating points under a suspended needle. The details are lost to history but soon this standard compass became the ‘soul of a ship’ on sea vessels for European mariners.

Seasonal winds of the Mediterranean determined sailing schedules for millennia, keeping ships in wait until favorable conditions. Most harbors were closed from October to April, a rest from demanding labors of summer sailing. The names of these winds were illustrated most beautifully to this day on the Tower of the Winds in Plaka Athens. These wind directions from north – *boreas*, northeast - *kiakos,* east - *apeliotes*, southeast - *euros,* south - *notos,* southwest - *lips,* west - *zephyros* and *skiron* - northwest - became the cardinal points of the wind rose, the traditional indicator plate of the compass. Italian names for the same are: *tramontana, greco, levanter, sirocco, ostro, libeccio* or *garbino, ponente, maestro,* also known as the northwest gale of the *mistral*. The *fleur de lis* was added as the sign of north, in deference of the French monarch Charles d’Anjou, then also King of Naples. The device was refined when someone created the gimbal mount – concentric circle pin structures which allow the magnetic needle to keep approximate position in spite of the rolling of the vessel. Columbus’s own compass was double gimbaled with a painting of the Virgin Mary and Jesus at its center instead of the wind rose. He made it to land anyway.

More mundane yet essential for trade was the development of planned stowage and protective dunnage packing with proper ballast in ships. The safe stowage of goods was a practical challenge to ensure the security of amphora and precious marble and perishables for sea transport. If the grain from Egypt got wet during the voyage north, all was lost, especially for the hungry population of Italian cities. Archeological evidence reveals the care taken to store and preserve trade goods. This concern continues to this day, a presumed service of ship transport.

Iron and steel ship construction with steam and internal combustion engines began the expansion of world trade by increasing capacity and reliability. This change in ship building has given some reprieve to the last far forests from total loss, however still ravaged for other uses. Though iron ships were not an innovation in the Mediterranean – Britain, the US and Germany led this industry – France & Italy were home to a few later marine innovations. Ferdinand Lessups’ massive engineering efforts to build the Suez Canal led the world into ever larger construction projects. Marconi’s radio was first developed for marine use and then spread across the world in many applications. Stabilizers with gyroscopic wings along the mid hull first made for the transatlantic *Rex* became standard in all subsequent passenger liners.

Recent decades have proven the Fincantieri shipyard near Trieste to have mastered the most advanced cruise ship construction in the world. High speed auto and truck ferries also ply the Mediterranean in a new era of marine transit, connecting trans-Mediterranean ports in mere hours. Time is compressed and the modern economics are dependent on rapid delivery of perishable goods, especially passengers.

An exception to this pace is the boom of the cruise industry, catering to a mass clientele with more time at leisure than ever before. Ports which once braced for siege or blockade by enemies now endure daily swarms of waddling tourists cramming the historic old quaysides. The Mediterranean at peace is now congested by consumption, an growing environmental challenge. The recent sinking of the Costa Concordia was emblemic of the new era of pollution for pleasure. The disaster was apparently due to reckless sail-by for a view of the island of Giglio, a tragic error for some momentary pleasure. What would Poseidon do?

Scientific study of the oceans also began in the Mediterranean when Aristotle wrote the first initial descriptions of sea life. Generations of fishermen have been certainly familiar with the harvest of the marine world with limited knowledge of its ecology. Old Roman mosaics show the abundance of the sea creatures including whales, now long gone from the mix of sea life. Free diving gave humans the first look at the wondrous but dangerous world underwater. Diving bells were used in Roman times to recover valuables from inshore wrecks. But the curiosities of the deep were largely feared. The watery grave was perhaps more feared than any imagined Hell. The Abyss was real and profoundly unknown. An illustration in Dante’s Inferno features a sea bed full of snakes rising to devour sinners.

The Arab general Amr ibn El-Ãs who conquered Egypt in 641 AD, wrote of travel on the sea, “Trust it little, fear it much. Man at sea is an insect on a splinter, now engulfed, now scared to death.” Many a cavalry officer has not been brave at sea. He nonetheless would be called amir-ar-rahl "chief of the transport," officer in the Mediterranean fleet, from which European languages took the rank of admiral.

Scientific study understanding of the complex ecology of the sea was not a dedicated effort until Prince Rainier of Monaco sponsored research by the young Jacques Cousteau aboard his ship the *Calypso*. His invention of the Aqua Lung or self contained underwater breathing apparatus - SCUBA - opened the seas to explorers and sport diving. This opened the ocean frontier to tactile research and marine archeology, a great leap forward into the oceans. “The finest treasures in the world are waiting in the Mediterranean, now within range of the lung. She is the mother of civilization, the sea girt with the oldest cultures, a museum in sun and spray.”

As with many other modern developments, the surprising becomes mundane and destructive with mass application. Scuba is now restricted in many places for the damage done by too many divers on sensitive marine life habitats. Greece does not permit any recreational diving to prevent the plundering of the many ancient shipwrecks in the Aegean. Yet this one technical breakthrough has allowed millions of people to venture into the oceans and has changed our view and understanding of the life aquatic.

As on land, the centuries of warfare at sea in the Mediterranean are a tide of drama and despair. The grim details of battles, siege & pillage of ports and populations does not give much honor to our species even as our contemporary life is forged from these tragedies and victories. Yet certainly the rise and fall of nations and empires has been led by improvements in military and naval techniques. The naval galleys had banks of rowers, the largest on record with hundreds of slaves. Bows were fitted with bronze *rostrum* for ramming enemy vessels. The ‘rostrum’ speaking podium was originally taken from a vanquished Carthaginian ship and brought to Rome as a trophy for speakers.

The list of naval warfare innovations in the Mediterranean is long: from ‘Greek fire’ – naphalm, to the *corvus* boarding platform of the Roman marines to ship’s cannon to the Exocet missile. This “Sea of War” has had a long list of momentous battles. The most recent naval action was in 1967 when an Israeli gunboat and planes attacked the U.S. Navy ship *Liberty* in 1967, killing 34 U.S. sailors, officially due to ‘mistaken identity”. The Mediterranean still bristles with armed ships on watch.

Mediterranean shore & riverine communities had a conundrum between prosperity and security. Good harbors meant strategic exposure to hostile navies. Highlands were stages for sieges. The ancient response was to build ever stronger fortresses and forge alliances with potential rivals. Friendly traders could also provide critical information to enemies. Foreign traders and travelers were literally ‘kept at bay’ until their *‘passe de port’* could be examined and approved.

Ships needed to exhibit formalities to indicate peaceful intentions upon entering foreign waters. To this day ‘courtesy’ flags are flown to show good intentions. Submission to local authorities was a prerequisite to landing and trade. A ‘shot across the bow’ was the answer to intruders not displaying the proper intent. Prior to munitions, a few well aimed arrows would do.

Though much of the ‘art of war’ was developed on land and around the world, the effects of such grim science has come back to haunt the Mediterranean in modern times. The sea floor is littered with stratum of sunken ships, the most recent the vast wreckage of World Wars I & II, some no doubt sunk upon the remains of previous victims of now obscure conflicts.

The building of robust warships also made for the capabilities to build stronger trading vessels. Piracy is the corollary of trade, perhaps the world’s third oldest profession. Thus most trading vessels carried some protection if only in small arms. The classic Mediterranean galley had a high ‘aft castle’ as later sea ships had a ‘fore castle’. These structure provided a position of defense from attackers and protection from waves.

Piracy is known as long as any sea records. According to Plutarch, in 75 BC off the coast of Sicily, Julius Caesar was seized by pirates. “You do not know who you have captured!” bellowed the Emperor. Held 38 days, he cajoled and played board games with his captors until 50 gold talents was delivered for his release. Caesar later returned with his navy, captured and crucified the lot.

Piracy would continue, often as a unofficial war between states sending bandits to plunder the competition. Punitive missions would continue a cycle of retribution. Once the seas and coasts were too dangerous for peaceful trade, naval action would assert control. Restored peace would endure until the next cycle of disorder and mayhem. The last era of this in the Mediterranean was the drawn out battles with the Barbary pirates and their protectorates along the north African coast.

But between the battles for control of the Mediterranean, local and longer trade went on as it could. The merchant – ‘song of the sea’ was the humble norm, honest exchange of the goods that were needed. The Mediterranean is a natural marketplace. The tropical southern shore produces grain, fruit and exotic goods from inner Africa, all desired by the northern seashore and inner Europe. Egypt was a grain exporter for centuries, feeding Venice and other growing cities. Rivers brought this trade deep into the continents. But without the Mediterranean, the goods would have only been local to the valleys. The elite of many nations had access to precious items – metals, jewels, spices, pets and perhaps most influencial, the visit of far off peoples from north, south, east and west, enriching otherwise isolated communities to the possibilities of the wider world. Trade to foreign lands across the sea was a dangerous business, whetting appetites for conquest. But it led to the initial global consciousness that has expanded to the whole world. Merchants made the first shared languages, Pheonician, Greek, Genovese, Catalan, French, Arabic. Many a sailor trader spoke many tongues along a seasonal course across the sea.

Merchants were not always valued by land society. Herodotus called them dishonest for extracting maximum profits through deceit. He and later warrior elitists would claim that conquest and plunder were a more noble calling. It has taken humanity many millennia to foreswear this ethos. Even then, business and now multinational corporate practices are still suspect even if humanity’s worst beasts have been somewhat tamed.

The other trade that kept the Mediterranean busier that it should have been was slavery. The galleys required manpower, brutally pressed into service for war and trade. Ship service focuses human identities by specialized labors and requires definitive command structures. When a ship is threatened by storm or enemy, it is either ‘do or die’, as has happened all too often on countless vessels.

The line from the film Ben Hur: “We keep you alive to serve the ship” may have been invented for drama, but the reality of ship servitude was real. The ever larger galleys required ever greater numbers of slaves, impelling the raiding of far shores for the ability to raid farther shores. During the furious 1400-1500’s in the battles for control of the Mediterranean between the Ottomans and sometimes allied Christian forces, markets in seaports traded galley and domestic slaves par course. In the flesh markets of Algiers a captured Italian woman could be bought for one onion. How prices have changed!

The battles between Islam and Christendom over control of the Mediterranean are a long and bloody history. Only by valiant expense of blood and tactical fortune did Southern Europe avoid conquest by the Ottoman Empire. The Siege of Malta in 1565 and the epic sea battle of Lepanto in 1571 saved Italy from certain invasion. European nations had by the 18th century military and industrial capabilities to assert control over the southern shore. The recent colonial period with Britain, Spain, France and Italy dominating stretches of the south coast of the Mediterranean have left North Africa in a long limbo of uncertainty. Independence after World War II was followed by local wars and recurring dictatorships. In our current time the nations of North Africa are still in turmoil, to an uncertain future. Now the Mediterranean is no barrier to rapid transport and sudden transformation as in the events of the Arab Spring.

The demographics of the past century have altered the long human equation of the Mediterranean. The more watered and fertile expanses of Europe once supported a far larger population for centuries than the north African coast. For millenia, a few million Egyptians lived in relative abundance, however subject to invasion, floods and plagues. The Nile was long a center of prosperity, but it has outgrown now its agricultural potential. Today more than 80 million Egyptians desperately need imports of the food staples they once exported. Ships arrive from the ports of the Black Sea and the Americas to feed the former breadbasket of the Mediterranean.

Similarly the oasis cities of the Libyan and Algerian coast which once had small populations have expanded beyond their local agriculture. Vast numbers of Africans from sub Sahara now press upon Europe as economic refugees. And they press by vessels landing on the beaches of the north Mediterranean. Where Cro-Magnums once paddled across from Gibraltar to hunt in the forests of North Africa, refugees now flee for the relatively greener fields of Spain. This tide will only increase as Africa’s population boom continues, while the native populations of Europe slowly diminish. The Mediterranean is once again in the center of ethnic, economic, religious and political disputes. Governments struggle to police the sea and its smuggled commodities, especially humans.

This arena is an essential forum for the future of humanity. If the greater community of the Mediterranean can be peacefully managed to satisfy the needs of its vast population, this may be the model for other less compressed regions.

All the while amidst human convolutions on land, sea life suffers. Shore communities, once prosperous with bountiful fishing industry, are now going extinct as the last sustainable species are scoured from the sea. Fisher communities are now replaced by marinas and resort developments. The urban imposition on formerly vibrant intertidal marshes and littoral ecosystems is unrelenting. One half of the French Mediterranean coast now has concrete seawalls rather than natural shore. Breakwaters and landfills have devoured the spawning grounds of the sealife. The ‘fresh seafood‘ offered in many a café comes from afar, frozen. Humans arrive in winter and summer swarms drawn by the sea and proceed unwittingly to destroy the attraction. The sea may look the same from above, glittering in the warm sun, but below the water is a wasteland. Toxic runoff and invasive algae have robbed the indigenous inshore life of its home. Vast coastal stretches are now given over to container ports with great walls of steel boxes full of the world’s products. Desalinization plants spew warm brine and toxic minerals into the sea. A saltier Mediterranean kills the microscopic life that is the basis of the food chain for fish and sea mammals.

There are now over 2 million ships and boats along the shores of the Mediterranean. The previous widespread dumping of sewage, garbage and oil into the waters is banned, though still a challenge to enforce. A new insult to the Mediterranean waters is that new ship wrecks unlike the old wooden are toxic with oil, plastics and complex materials that decompose into toxic compounds. One lost yacht is a cocktail of poisonous debris.

What is the Mediterranean’s future? Will this former Sea of War between its conflicted nations become a more cooperative Sea of Peace? President Sarkozy has put forth a proposal for a Mediterranean Community to diffuse any disputes and coordinate economic development. The Arab Spring uprisings have cast much of the region’s political stability into doubt, but with great hope for better governance for all.

Environmental sound economic development of North Africa is a key to the future. The effort is reliant on European markets, from food products, oil and various natural resources. A large reservoir of deep water below the Sahara sands is now being tapped for expanded agriculture. The vastness of the Sahara could also provide plenty of room for solar panels to power the energy needs of Europe. This presumes ever greater use of the Mediterranean as a crossing, from more ships to underwater pipelines and cables. In recent decades local ships have become larger, faster and connect ever more ports on both shores. Future transport may flow through tunnels from Cueta on the Africa coast to Algecira near Gibraltar or between various Greek islands or to Italy or Tunisia. Perhaps heavy lift cargo air ships will float across and bypass the sea surface. New tunnels & bridges are already on the drawing boards: Calabria to Messina, a Bosphorus Canal, a large ship canal from Bordeaux to Biscay.

Even if the human communities learn to cooperate, the sea may not. It may become our fate that the world ocean may rise many meters in the next centuries, as it did after the last Ice Age, but now induced by human impelled global warming. The potential shore map shows flooded valleys and cities all around the Mediterranean. The *Atlantica* proposal of the German engineer Hans Strobel in the 1930’s to build a dam at Gibraltar with locks into the Atlantic and reclaim vast shallows of the sea for *lebensraum* - may soon be required to protect the historic ports of the Mediterranean. The cost of shore barrages to protect many more Venices is an expense that is unimaginable. Or will the old lands be damned and new upland or floating cities be built?

Climate change may make the Mediterranean warmer or colder, wetter or dryer. It is a wild bet either way as all scientific projections are contingent on numerous factors any of which may vary to cast any projection into the sea spray. Will the Mediterranean be a more stormy, icy, tropical or saltier sea? Will any of the current marine life survive these changes? The recent invasive species – Red Sea lion fish, algae, vampire worms, etc. may survive while the native creatures from plankton to sponges to octopus may disappear.

Future climate change, natural or man induced may be to some benefit. Perhaps the Sahara & Levant will eventually be re-greened with forests by a cooling wetter environment as in millennia long ago. Current plans for extensive Sahara oasis expansion via deep wells for agriculture production could add humidity to Mediterranean climate and initiate this transformation. But the region is vast and human efforts are relatively small. It took thousands of years for the shores of the Mediterranean to be deforested and desertified. Only 15% of the shores have remnant forest growth, stunted by aridification. Only larger climate differentials and less human impact will allow a regrowth. In the face of relentless human economic activity, all this is unlikely. Since the Industrial Revolution, leveraged by technology, humanity has reached a malignant stage of growth in population and environmental impact. The Mediterranean, having long been at the center of this evolution, is a large laboratory for the ecological effects and forensics of civilization. Jacques Cousteau looked into his home sea and noted, “The Mediterranean will be the first sea to die and will be a warning to the world.”

In the possibilities of climate cycles, volcanic eruptions and the ever ongoing continental shifts, much less some astronomical event such as an asteroid collision, the Mediterranean could seal up from the Atlantic and dry out again in a super heated planet. We - as a species - were not around during the first desertification of the Mediterranean in the Miocene era 5 million years ago and may not survive to witness a 2nd Messinian Crisis. Meanwhile, *carpe diem!*

Perhaps some light year in the future – if there even is a linear future – some sentient being may come to the remains of a transformed Mediterranean and probe into the fate of this sea that was the cradle of human development. It may find charming ruins of airports and condominiums, fossilized Fiats and underwater mega yachts full of mutant marine life and ponder the fate of *homo-mediterraneus*.

Or if our *homo-capabilis* somehow endures, covering the earth with urban sprawl and high tech support systems, will the Mediterranean become a marine reserve and recreational lake with uber-resorts all around? Club Med could become its own leisure-class nationality, with courteous robots doing all the tasks to keep the long retired yet still active aged humanoids well serviced. But I leave these lovely speculations to science fiction writers…

Meanwhile for all the troubles of the past and challenges of the present, the Mediterranean endures. Marine and human life are a remarkable renewing resource, however mortal the mere individual in the flux. We wish our descendents courage as they inherit our heritage and hope they may solve some of our environmental legacy. As a paleo-geologist would say, “It’s not my fault!”

This saying from the Roman emperor Pompeius Maximus sums the fate of the Mediterranean and its past, present and future mariners:

***Navige neccesce est, viviere non neccae*** To sail is necessary, life is not necessary

May humanity and the Mediterranean endure together in change….

*e pluribus commutatius*!

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