

Earth

In the early 7th century, the two most powerful empires at the time were the Byzantine[1] and Persian Empires. In the years 613 - 614 C.E the two Empires went to war, with the Byzantines suffering a severe defeat at the hands of the Persians. Damascus and Jerusalem both fell to the Persian Empire. In the chapter, *The Romans*, in the Holy Quran, it is stated that the Byzantines had met with a great defeat but would soon gain victory:

"The Romans have been defeated in the lowest land, but after their defeat they will soon be victorious. Within three to nine years. The decision of the matter, before and after, is with God." (Quran 30:2-4)



These verses, above, were revealed around 620 C.E, almost 7 years after the severe defeat of the Christian Byzantines at the hands of the idolater Persians in 613 – 614 C.E. Yet it was related in the verses that the Byzantines would shortly be victorious. In-fact, Byzantine had been so heavily defeated that it seemed impossible for the Empire to even maintain its very existence, let alone be victorious again.

Not only the Persians, but also the Avars, Slavs and Lombards (located to the North and West of the Byzantine Empire) posed serious threats to the Byzantine Empire's sovereignty.

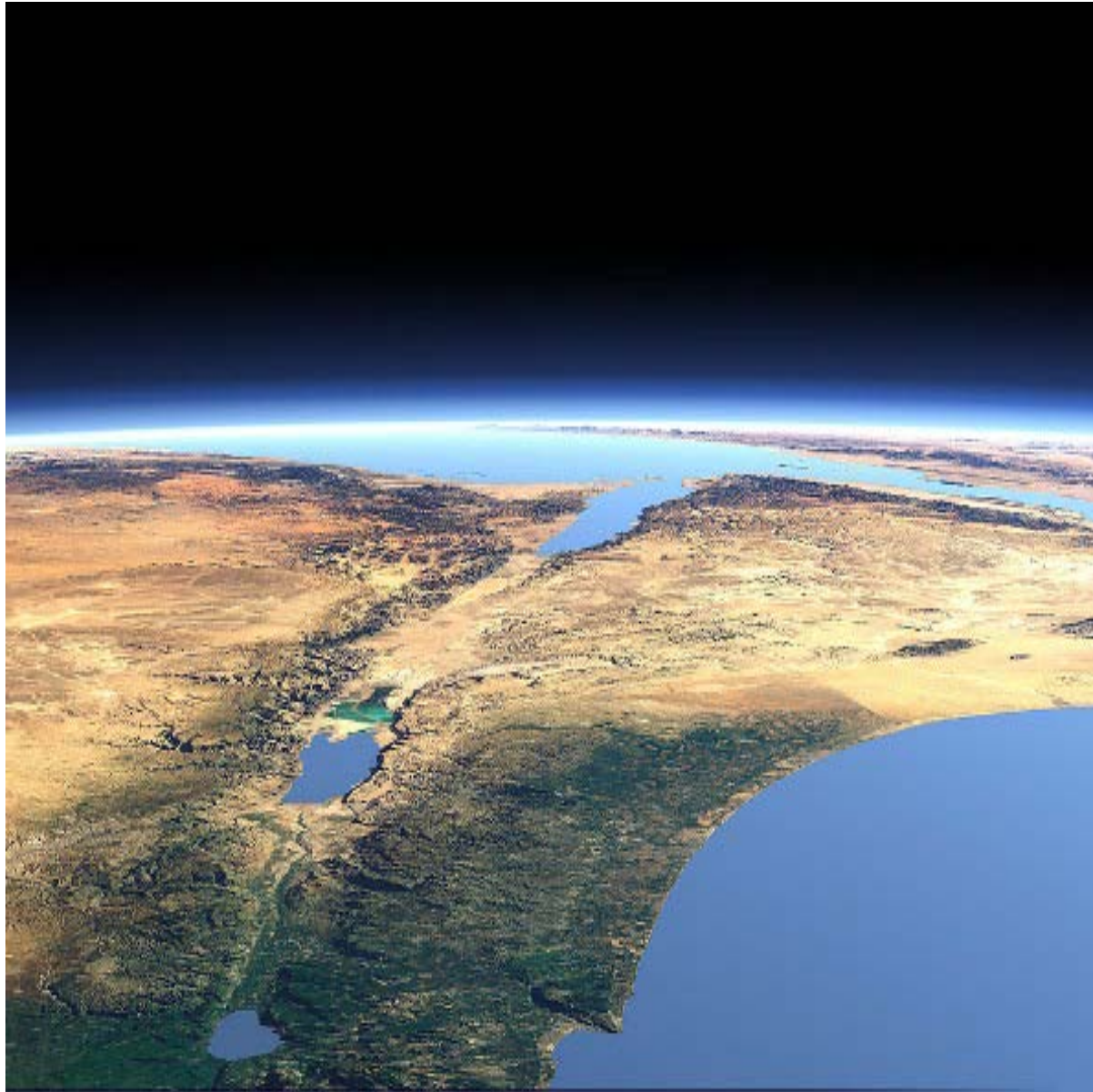
The Avars had come as far as the walls of Constantinople and had nearly captured the Emperor, himself. Many governors had revolted against Emperor Heraclius, and the Empire was on the point of collapse. Mesopotamia, Syria, Palestine, Egypt and Armenia, which had earlier belonged to the Byzantine Empire, were invaded by the Persians. In short, everyone was expecting the Byzantine Empire to be destroyed, but right at that moment the first verses of the chapter, *The Romans*, were revealed announcing that the Byzantines would regain triumph in a few years time. Shortly after this revelation, the Byzantine Emperor proceeded to order the gold and silver in churches to be melted and turned into money in order both to meet the demanding expenses of the army, and finance his drive to regain the lost territories.

Around 7 years after the revelation of the first verses of *The Romans*, in December, 627 C.E, a decisive battle between The Byzantine Empire and the Persian Empire was fought in the area around the Dead Sea,[2] and this time it was the Byzantine army which surprisingly defeated the Persians. A few months later, the Persians had to make an agreement with the Byzantines which obliged them to return the territories they had taken from them. So, in the end, the victory of the Romans proclaimed by God in the Quran miraculously came through.

Another miracle revealed in the mentioned verses is the announcement of a geographical fact that no-one would have been able to discover in that period. In the third verse of *The Romans*, it was mentioned that the Romans were defeated *"in the lowest land"* (Quran 30:3). Significantly, the places where the main battles took place (in Damascus and Jerusalem) lie in a vast area of low-lying land called the Great Rift Valley. The Great Rift Valley is a huge 5,000 km fault line in the earth's crust that runs from northern Syria in the Middle-East of Asia to central Mozambique in East Africa. The northernmost extension runs through Syria, Lebanon, Palestine and Jordan. The rift then extends south to the Gulf of Aden, makes its way through East Africa, then finally ends at the lower Zambezi River valley in Mozambique.

Thanks for visiting our website please tell to your friends also about our site so that they can also increase there knowledge Remember us in your prayers.www.scienceandislam.yolasite.com

An interesting fact that has been discovered recently, with the help of satellite images, is that the area around the Dead Sea (located in the Great Rift Valley) has the lowest altitude on Earth. In fact, the lowest point on Earth is the shoreline of the Dead Sea, with an altitude of around 400 meters[3] below sea level. The fact that it lies at the lowest point means that water does not drain from the sea. No land point on earth has a lower altitude than the shoreline of the Dead Sea.[4]



The Jordan Valley forms the northmost branch of the east african rift system. It continues with the Dead Sea, the lowest point on the earth surface and the Gulf of Aqaba and the Red Sea in the background.

Therefore it becomes clear that the country or prefecture which occupies the rift valley in the vicinity of the Dead Sea is what is meant in the Quran by "the lowest land." This is a true miracle of the Quran because no-one could have known or foreseen such a fact in the 7th century due to the fact that satellites and modern day technology were not available at the time. Once again, the only possible explanation is that Prophet Muhammad had truly received divine revelation from God, The Creator and Originator of the universe.

Thanks for visiting our website please tell to your friends also about our site so that they can also increase there knowledge Remember us in your prayers.www.scienceandislam.yolasite.com

Footnotes

- [1] The Arabs also refer to the Byzantines as the Romans.
 [2] *The History of Persia Part I: Ancient Persia* by Scott Peoples
 [3] (<http://hypertextbook.com/facts/2000/SanjeevMenon.shtml>)
 [4] (<http://www.elnaggarzr.com/index.php?l=ar&id=51&cat=6>)
 Source: Islamreligion.com

GIANT UNDERWATER WAVES



Before we read this news from science

daily let's read what Quran says about the Underwater Waves.

Allah (SWT) says: *"Or (the unbelievers' state) is like the layers of darkness in a deep sea covered by waves topped by waves, topped by clouds: Layers of darkness, one above another. If a man stretches his hand, he can hardly see it. For any to whom Allah gives no light, there is no light."*(Quran 24: 40)

The Qur'an mentions that the deep sea is covered by waves: *"Or like the layers of darkness in a lujji sea topped by waves"*. The Verse mentions that there are other waves atop the first waves. Allah (SWT) says: *"covered by waves topped by waves..."* This is a characteristic of the sea in that it has two types of waves atop one another. They are not successive waves in one place but simultaneous waves, the second type atop the first. The verse states that over these waves, which cover the deep sea, there are other waves. Allah (SWT) says: *"topped by clouds."* These other waves are none but the waves at the surface of the sea that must cover the first waves.

This is crucial evidence that the knowledge conveyed by the Qur'anic verse has been revealed by Allah, Who knows the secrets of heaven and earth.

Tides, Earth's Rotation Among Sources of Giant Underwater Waves

ScienceDaily (Mar. 7, 2010)

Scientists at the University of Rhode Island are gaining new insight into the mechanisms that generate huge, steep underwater waves that occur between layers of warm and cold water in coastal regions of the world's oceans.

David Farmer, a physical oceanographer and dean of the URI Graduate School of Oceanography, together with student Qiang Li, said that large amplitude, nonlinear internal waves can reach heights of 150 meters or more in the South China Sea, and the effects they have on surface wave fields ensure that they are readily observable from space.

Farmer and Li are reporting results of their research at the Ocean Sciences Meeting of the American Geophysical Union in Portland, Ore.

"The large waves in the South China Sea have attracted a fair bit of attention in recent years," Farmer said, "but much of this has been directed at the interaction of the waves with the sloping continental shelf of mainland China where they break, overturn and produce intense mixing. Our focus is on the way in which

Thanks for visiting our website please tell to your friends also about our site so that they can also increase their knowledge Remember us in your prayers.www.scienceandislam.yolasite.com

they are generated in Luzon Strait, between Taiwan and the Philippines, and the way they evolve as they propagate westwards across the deep ocean basin of the South China Sea."

Farmer and Li studied the evolution of large internal waves occurring at tidal periods generated by currents traversing submarine ridges in Luzon Strait. As these waves travel west through the South China Sea, they steepen and evolve into packets of steep, energetic waves occurring at periods of 20-30 minutes. It is these energetic short period waves that modulate the ocean surface roughness, making their presence observable from satellites in space.

The URI scientists' observations showed that the Earth's rotation modifies internal waves as they travel cross the deep basin. This effect mainly influences the internal waves that form on the 24-hour period of diurnal tides, dispersing the energy and inhibiting the steepening process. Internal waves that form on the semi-diurnal tides are not affected in this way, are more readily steepened and then break into the energetic, short period waves.

Farmer and Li studied internal waves in the South China Sea using pressure equipped inverted echosounders, instruments developed by scientists at the University of Rhode Island. From the seafloor, the device transmits an acoustic pulse and then listens for the echo from the sea surface. Sound travels faster through warm water than it does through cold water, so changes in the echo delay allow measurement of the thickness of the warm surface layer, enabling the shape and size of passing internal waves to be recorded.

According to Farmer, nonlinear internal waves impact the ocean in many ways: stirring up sediment on the sea floor, creating hazards to offshore engineering structures, interfering with submarine navigation, and greatly affecting propagation of underwater sound. Internal waves also appear to have significant, if not fully understood, biological impacts, and in shallow water environments they can mix water masses and modify coastal circulation.

The Mountains as Establisher for the Earth

"And the mountains He has fixed firmly, (To be) a provision and benefit for you and your cattle." (SuratAn-Nazi'at (Those Who Pull Out): 32-33)

In these two Qur'anic verses it is explicitly stated that the stabilization of the Earth by means of its mountains was a specific stage in the long process of creation of our planet and still is a very important phenomenon in making that planet suitable for living. Now, the following question arises: how can modern Earth Scientists visualize mountains as means of fixation for the Earth? As mentioned above, the rocky outer cover of the Earth (the lithosphere, which is 65-70 km thick under oceans and 100-150 km thick under continents) is broken up by deep rift

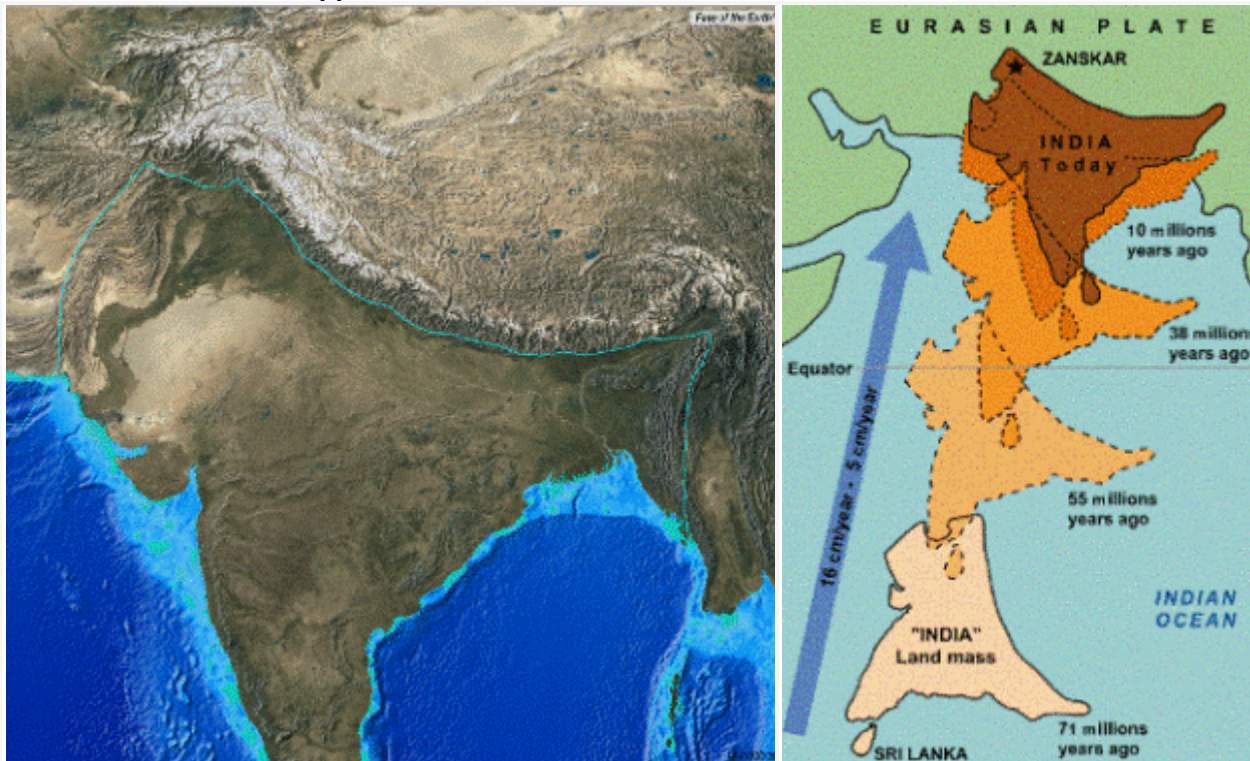


systems into separate plates (major, lesser and minor plates as well as micro plates, plate fragments and plate remains). Each of these rigid, outer, rocky covers of the Earth floats on the semi-molten, plastic outermost zone of the Earth's Mantle (the asthenosphere) and move freely away from, past or towards adjacent plates. At the diverging boundary of each plate, molten magma rises and solidifies to form strips of new ocean floor, and at the opposite boundary (the converging boundary) the plate dives underneath the adjacent plate '(subducts) to be gradually consumed in the underlying uppermost mantle zone (the asthenosphere) at exactly the same rate of sea-floor spreading on the opposite boundary. An ideal rectangular, lithospheric plate would thus have one edge growing at a mid-oceanic rift zone (diverging boundary), the opposite edge being consumed into the asthenosphere of the over riding plate (converging or subduction boundary) and the other two edges sliding past the edges of adjacent plates along transform faults (transcurrent or transform fault boundaries, sliding or gliding boundaries). In this way, the lithospheric plates are constantly shifting around the Earth, despite their rigidity, and as they are carrying continents with them, such continents are also constantly drifting away or towards each other. As a plate is forced under another plate and gets gradually consumed by melting, magmatic activity is set into action. More viscous magmas are intruded, while lighter and

more fluid ones are extruded to form island arcs that eventually grow into continents, are plastered to the margins of nearby continents or are squeezed between two colliding continents. Traces of what is believed to have been former island-arcs are now detected along the margins and in the interiors of many of today's continents (e.g. the Arabian Shield). The divergence and convergence of lithospheric plates are not confined to ocean basins, but are also active within continents and along their margins. This can be demonstrated, by both the Red Sea and the Gulf of California troughs which are extensions of oceanic rifts and are currently widening at the rate of 3cm/year in the former case and 6 cm/year in the latter. Again the collision of the Indian Plate with the Eurasian Plate (which is a valid example of continent/continent collision) has resulted in the formation of the Himalayan Chain, with the highest peaks currently found on the surface of the Earth. Earthquakes are common at all plates' boundaries, but are most abundant and most destructive along the collisional ones. Throughout the length of the divergent plate boundary, earthquakes are shallow seated, but along the subduction zones, these come from shallow, intermediate and deep foci (down to a depth of 700 km), accompanying the downward movement of the subducting plate below the over-riding one. Seismic events also take place at the plate's transcurrent fault boundaries where it slides past the adjacent plates along transform faults. Plate movements along fault planes do not occur continuously, but in interrupted, sudden jerks, which release accumulated strain. Moreover, it has to be mentioned that lithospheric plates do not all travel at the same speed, but this varies from one case to another. Where the plates are rapidly diverging, the extruding lava in the plane of divergence spreads out over a wide expanse of the ocean bottom and heaps up to form a broad mid-oceanic ridge, with gradually sloping sides (e.g. the East Pacific Rise). Contrary to this, slow divergence of plates gives time for the erupting lava flows to accumulate in much higher heaps, with steep crests (e.g. the Mid-Atlantic Ridge). The rates of plate movements away from their respective spreading centers can be easily calculated by measuring the distances of each pair of magnetic anomaly strips on both sides of the plane of spreading. Such strips can be easily identified and dated, the distance of each from its spreading center can be measured, and hence the average spreading rate can be calculated. Spreading rates at mid-oceanic ridges are usually given as half-rates, while plate velocities at trenches are full rates. This is simply because the rate at which one lithospheric plate moves away from its spreading center represents half the movement at that center as the full spreading rate is the velocity differential between the two diverging plates which were separated at the spreading center (the mid-oceanic ridge). In studying the pattern of motion of plates and plate boundaries, nothing is fixed, as all velocities are relative. Spreading rates vary from about 1 cm/year in the Arctic Ocean, to about 18cm/year in the Pacific Ocean, with the average being 4-5 cm/year. Apparently, the Pacific Ocean is now spreading almost ten times faster than the Atlantic (c.f. Dott and Batten, 1988). Rates of convergence between plates at oceanic trenches and mountain belts can be computed by vector addition of known plate rotations (Cf. Le Pichon, 1968). These can be as high as 9 cm/year at oceanic trenches and 6 cm/year along mountain belts (Le Pichon, op. cit.) Rates of slip along the transform fault boundaries of the lithospheric plate can also be calculated, once the rates of plate rotation are known. The patterns of magnetic anomaly strips and sediment thickness suggest that spreading patterns and velocities have been different in the past, and that activity along mid-oceanic ridges varies in both time and space. Consequently such ridges appear, migrate and disappear. Spreading from the Mid-Atlantic rift zone began between 200 and 150 MYBP, from the northwestern Indian Ocean rift zone between 100 and 80 MYBP, while both Australia and Antarctica did not separate until 65 MYBP (cf. Dott and Batten, bc. cit.). Volcanoes also abound at divergent boundaries, whether under the sea or on land. Most of these volcanoes have been active for a period of 20-30 million years or even more (e.g. the Canary Islands). During such long periods of activity, older volcanoes were gradually carried away from the spreading zone and its constantly renewed plate edge, until they became out of reach of the magma body that used to feed them and hence gradually faded out and died. The floor of the present-day Pacific Ocean is spudded with a large number of submerged, non-eruptive volcanic cones (guyots) that are believed to have come into being by a similar process.

Formation of mountains in continental collisions

Continental orogenic belts are the result of plate boundary interaction, which reaches its climax when two continents come into collision, after consuming the ocean floor that used to separate them. Such continent/continent collision results in the scraping off of all sediments and sedimentary rocks, as well as volcanic rocks that have accumulated on the ocean floor and in the oceanic trenches and squeezing them between the two colliding continents. This results in considerable crumpling of the margins of the two continents, followed by the cessation of plate movement at the junction. The two continental plates become welded together, with considerable crystal shortening (in the form of giant thrusts and infrastructural nappes) and considerable crystal thickening (in the form of the decoupling of the two lithospheric plates as well as their penetration by the deep downward extensions of the mountainous chains then formed). Such downward extensions of the mountains are commonly known as "mountain roots" and are several times their protrusion above the ground surface. Such deep roots stabilize the continental masses (or plates), as plate motions are almost completely halted by their formation, especially when the mountain mass is entrapped within a continent as an old craton.



The two continents are welded together due to squeezing the rocks in-between in the collision forming deep-rooted mountains which stabilize the two continental plates.

Again, the notion of a plastic layer (asthenosphere) directly below the outer rocky cover of the Earth (lithosphere) makes it possible to understand why the continents are elevated above the oceanic basins, why the crust beneath them is much thicker (30-40 km) than it is beneath the oceans (5-8 km) and why the thickness of the continental plates (100-150 km) is much greater than that of the oceanic plates (65-70 km). This is simply because of the fact that the less dense lithosphere (about 2.7 to 2.9 gm/cm³) is believed to float on top of the denser, and more easily deformed, plastic asthenosphere (> 3.5 gm/cm³), in exactly the same way an iceberg floats in the oceanic waters. Inasmuch as mountains have very deep roots, all other elevated regions such as plateaus and continents must have corresponding (although much shallower) roots, extending downward into the asthenosphere. **In other words, the entire lithosphere is floating above the plastic or semiplastic asthenosphere, and its elevated structures are held steadily by their downwardly plunging roots.** Lithospheric plates move about along the surface of the Earth in response to the way in which heat flows arrive at the base of the lithosphere, aided by the rotation of the Earth around its own axis. There is enough geologic evidence to support

Thanks for visiting our website please tell to your friends also about our site so that they can also increase their knowledge Remember us in your prayers. www.scienceandislam.yolasite.com

the fact that both processes have been much more active in the distant geologic past, slowing gradually with time. Consequently, it is believed that plate movements have operated much more rapidly in the early stages of the creation of the Earth and have been steadily slowing down with the steady building-up of mountains and the accretion of continents. This slowing down of plate movements may also have been aided by a steady slowing down in the Earth's rotation around its own axis (due to the operating influence of tides which is attributed to the gravitational pull of both the sun and the moon) and also by a steady decrease in the amount of heat arriving from the interior of the Earth to its surface as a result of the continued consumption of the source of such heat flows which is believed to be the decay of radioactive materials. The above mentioned discussion clearly indicates that one of the basic functions of mountains is its role in stabilizing continental masses lest these would shake and jerk, making life virtually impossible on the surface of such continents) The precedence of the Glorious Qur'an with more than 14 centuries in describing this phenomenon is a clear testimony for the fact that this Noble Book is the word of the Creator in its divine purity and that **Muhammad (pbuh)** is His final Messenger. In an authentic saying, this noble prophet is quoted to have said that: **"When Allah created the Earth it started to shake and jerk, then Allah stabilized it by the mountains"**. This unlettered Prophet lived at a time between 570 and 632 A.C.) When no other man was aware of such facts, which only started to unfold by the beginning of the twentieth century, and was not finally formulated until towards its very end. The above mentioned four examples of Qur'anic verses include the basic foundations of the most recently established concept in Earth Sciences, namely "the concept of Plate Tectonics". This concept was only formulated in the late sixties and the early seventies of this century (cf. McKenzie 1967; Maxwell and others, 1970; etc.), i.e. about 1335 years after the time of Prophet Muhammad (pbuh) the concept is based on the following observed facts:

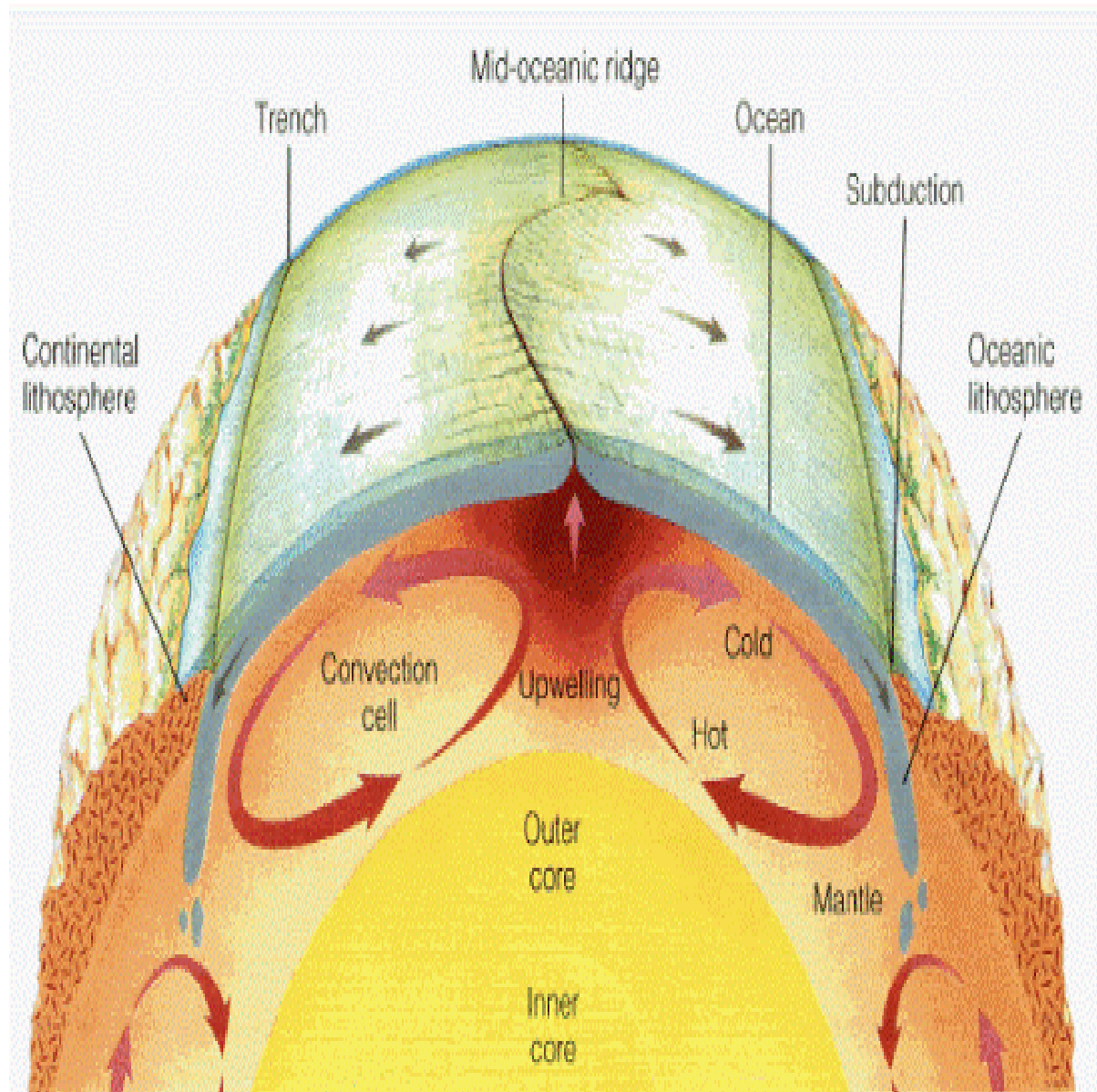
- a) That the outer rocky layer of the Earth is deeply faulted, and this is explicitly mentioned in the Qur'anic verse **"And the earth which splits."** (Surat At-Tariq (The Night-Come): 12).
- b) That hot lava flows pour out from such deep faults, particularly in the middle parts of certain seas and oceans, and this is clearly implied in the Qur'anic verse **"And the sea kept filled (or it will be fire kindled on the Day of Resurrection)."** (Surat At-Tur (The Mount):6).
- c) That the flow of such lavas can cause the surface of the Earth to shake and jerk, can lead to the movement of these faulted blocks and the formation of trenches in which deep roots of the mountains are formed. This is implied by both the verses **"And the earth which splits."** (Surat At-Tariq (The Night-Come): 12). And **"And the mountains as pegs?"** (Surat An-Naba' (The Great News):7).
- d) That these sudden jerky movements of the continental plates are halted by the formation of mountains and this is clearly emphasized in the verse **"And the mountains He has fixed firmly,"** (Surat An-Nazi'at (Those Who Pull Out): 32)., as well as in many other Qur'anic verses **"And it is He Who spread out the earth, and placed therein firm mountains and rivers and of every kind of fruits He made Zawjain Ithnain (two in pairs-may mean two kinds or it may mean: of two varieties, e.g. black and white, sweet and sour, small and big).He brings the night as a cover over the day. Verily, in these things, there are Ayat (proofs, evidences, lessons, signs, etc.) for people who reflect."** (Surat Ar-Ra'd (The Thunder): 3);
"And the earth We have spread out, and have placed therein firm mountains, and caused to grow therein all kinds of things in due proportion." (Surat Al-Hijr (The Rocky Tract): 19);
"And We have placed on the earth firm mountains, lest it should shake with them, and We placed therein broad highways for them to pass through, that they may be guided." (Surat Al-Anbiya' (The Prophets): 31);
"Is not He (better than your gods) Who has made the earth as a fixed abode, and has placed rivers in its midst, and has placed firm mountains therein, and has set a barrier between the two seas (of salt and sweet water)? Is there any ilah (god) with Allah? Nay, but most of them know not!" (Surat An-Naml (The Ants): 61);
"And have placed therein firm, and tall mountains, and have given you to drink sweet water?" (Surat Al-Mursalat (Those sent forth): 27);
"And the mountains He has fixed firmly." (Surat An-Nazi'at (Those Who Pull Out): 32)

History

These facts about our planet started to unfold only in the middle of the nineteenth century, more than 12 centuries after the revelation of the Glorious Qur'an, when George Airy (1865) came to realize that the excess mass of the mountains above sea-level is compensated by a deficiency of mass in the form of underlying roots which provide the buoyant support for the mountains. Airy (Op... cit) proposed that the enormously heavy mountains are not supported by a strong rigid crust below, but that they "float" in a "sea" of dense rocks. In such a plastic, non-rigid "sea" of dense rocks, high mountains are buoyed up at depth in more or less the same way an iceberg is hydrostatically buoyed up by water displaced by the great mass of ice below the water surface. In this manner, a mountain range is isostatic in relation to the surrounding portions of the Earth's Crust, or in other words, mountains are merely the tops of great masses of rocks mostly hidden below the ground surface, and floating in a more dense substratum as icebergs float in water. A mountainous mass with an average specific gravity of 2.7 (that of granite) can float into a layer of plastic simatic rock (with a specific gravity of 3.0) with a "root" of about 9/10, and a protrusion of 1/10 its total length. This ratio of mountain root to its outward elevation can some times go up to 15:1, depending on the difference in the average densities of both the mountain s rock composition and of the material in which its root is immersed. Such observations have led to the concept of isostasy (Dutton, 1889) and have introduced the principles of gravity surveying. Again, both seismic and gravitational evidences have clearly indicated that the Earth's crust is thickest under the highest of mountains and is thinnest under the lowest of oceanic basins. These studies have also proved that the shallowest parts of the oceans are situated in their middle parts (mid-oceanic ridges), while their deepest parts are adjacent to continental masses (deep oceanic trenches). Such observations could not be fully understood until the late sixties of this century when the formulation of "the concept of plate tectonics" has started to proceed apace. In this concept the outer rocky zone of the Earth (the lithosphere) is split by major zones of fractures (or rifts) into a number of slabs or plates (65-150 km thick and several thousands or even millions of square kilometers in surface area). These plates float on a denser, more plastic substratum (the asthenosphere) and hence, glide above it and move across the surface of the Earth. The movements of these lithospheric plates are accelerated by the pouring out of lavas at their divergent boundaries (at the rift zones) by the rotation of the Earth around its own axis as well as by hot plumes and convection currents rising to the bottom of such plates from within the asthenosphere. Consequently, the boundaries of lithospheric plates are outlined by the locations of frequent earthquakes and intensive volcanic activities. In their movements, lithospheric plates are accelerated at their divergent boundaries by the Outpouring lavas (molten rocks) that on cooling form new ocean floors, and are consumed at their convergent boundaries (by exactly the same rate of divergence) by subducting under the adjacent plates and returning to the Earth's interior where they gradually melt. At other boundaries, the plates simply slide past each other along transform faults.

Convection currents

In this manner, the plates shift across the Earth's surface and carry the continents with them, resulting in the phenomenon of continental drift. As the lithospheric plates move horizontally across the Earth's surface, they eventually collide, producing high mountain ranges that act as a means of fixation for the two moving plates and hence, stop them from further shaking and jerking, although earthquakes and volcanic eruptions may still be felt along the zone of collision. But once the mountainous chain has been trapped within a continental mass it will form a stable craton, without any volcanic activity or earthquakes. When one lithospheric plate is forced under another and starts to melt, magma rises to form island arcs that eventually grow into continents. All continents are believed to have their origins in processes of this kind, and further collision of continent/island arcs or continent/continent can lead to the further growth of continents and to the stability of the Earth's lithosphere. Lithospheric plates do not all travel at the same speed, and are believed to have been slowing down with time. The details of how the motion occurs are still in doubt, but two hypotheses have been put forward: Convection spreading and gravity spreading, the former of which seems to be gaining more support. Lithospheric plates probably move about in response to the way in which heat arrives at their base.



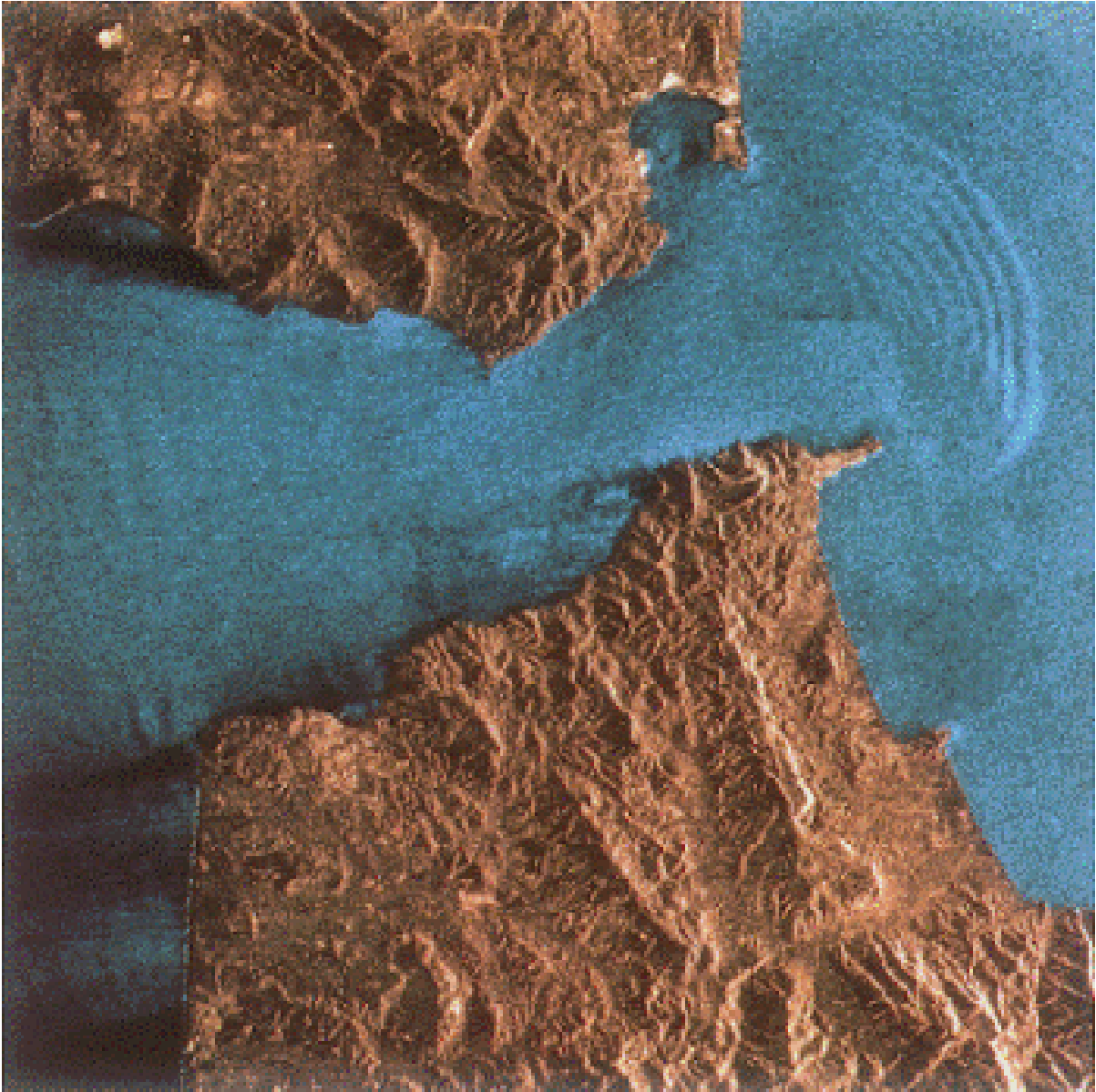
Convection Cell

Such movement was much faster in the geologic past, because of the faster rate of rotation of the Earth (or its spinning around its own axis) and the greater quantities of radioactive minerals that have been steadily decaying with time. The facts that the Earth is a deeply fractured and rifted planet, and that red-hot magma flows are steadily pouring out from such rifts are among the most recent discoveries in the field of Earth Sciences. Magmatic flows at mid-oceanic rift zones result in sea-floor spreading, the piling up of mid-oceanic basaltic ridges and in one of the most striking phenomena of our planet where seas and oceans experiencing such activities are actually set on fire and boiling at their bottoms. Again, magmatic flows at mid-oceanic ridges lead to the gradual descent of the oceanic lithospheric plate under the opposite continental one, forming deep oceanic trenches in which massive accumulations of sedimentary, igneous and metamorphic rocks accumulate and are finally crumbled to constitute a mountainous chain with a very deep root, which brings the movement of the two colliding plates to a big halt. The function of mountains as stabilizers for the Earth can be clearly seen in the role played by their very deep roots, which penetrate the total thickness of continental lithospheric plates (which are 100-150

Thanks for visiting our website please tell to your friends also about our site so that they can also increase their knowledge Remember us in your prayers. www.scienceandislam.yolasite.com

km thick) and float into the underlying, dense, viscous, semi-molten asthenosphere. This is justified by the fact that the motions of lithospheric plates come to a big halt when a continent collides with another continent, consuming the oceanic lithospheric plate that used to separate them. This produces what is known as a collisional-type mountain, which is believed to represent the last phase of mountain building. Here, the thickness of the continental lithospheric plate is doubled and mountains reach their maximum downward extensions and hence their greatest capacity of fixation. Without the formation of mountains, the movement of lithospheric plates would have been much faster and their collision more drastic. Again, through the process of orogenesis (mountain-building), the Earth's crust is periodically rejuvenated and continents are gradually built and accreted. New mineral wealths are added and new soils are produced (as by the elevation of mountains, weathering and erosional processes are activated). The more the mountainous chain is weathered and eroded, the more it will be isostatically elevated. This can go on until the mountain root is completely pulled out of the asthenosphere, and then erosion finally wins the battle over the mountain range as there is no more immersed part of the root to uplift the range by isostasy. The lithosphere beneath the eroded down mountain range will have the same thickness as the remainder of the continental interior to which it was plastered, which is more or less an equilibrium thickness. At this point, the old mountain system becomes a part of the stable craton, and hence the size of the continent is gradually increased. This goes on until the continent starts to fragment by an opposite process of rifting and diverging to form two or more continental masses separated by longitudinal seas that spread gradually into oceans (the continent / ocean cycle). These basic facts of our planet started to unfold to human knowledge since the mid-nineteenth century, and was never known before or visualized in anything near the above-mentioned framework until the late sixties of this century, when the concept of plate tectonics was in the process of shaping. The fact that the Glorious Qur'an (which was revealed) more than 14 centuries ago as the Book of Divine guidance) explicitly emphasizes the deeply fractured nature of the Earth and the oceans that are set on fire, as well as describes mountains as pickets (or pegs) and stresses their role as stabilizers for the Earth (in 22 different verses) is only one of numerous testimonies for the Divine nature of this Glorious Book. Prophet Muhammad (phuh) who lived between 570 and 632 A.C. is quoted to have said that: When Allah created the Earth, it started to shake and jerk, then Allah stabilized it by the mountains. This unlettered Prophet was definitely educated by the Divine revelation, as no man at his time and for several centuries after him knew anything about such geological facts which started to unfold only since the mid-nineteenth century and came to be understood only a few decades ago.

Internal Waves and Layers and Darkness Quran on Oceanography



- In 1300 AD, pearls divers used the first protective spectacles made of turtle shell.
- In 1860 AD creatures were discovered at the bottom of the Mediterranean by using an iron cable.
- In 1865 AD Rouquayrol and Denayrouze invented independent diving apparatus.
- In 1893 AD Butan was able to take photos under water.
- In 1920 AD the echo sounding method was used to measure the depths.
- In 1930 AD Otis Barton and William Beebe were able to dive in the first bathysphere to the depth of 3028 feet. (Masks, fins and respiratory tubes were invented then.)
- In 1938 AD Cousteau and Emile Gagnan carried out successful tests on a system known as Self-Contained Underwater Breathing Apparatus (SCUBA).
- In 1958 AD Experiments were carried out on the depth submersible (the Sixties) and respiratory gills for breathing under water were invented.
- Man managed to dive to the deepest area in Pacific Ocean, was able to stay in the deep for several days and discovered vents there and manufactured the yellow submarine and nuclear ones.

Modern Oceanographic Information

Thanks for visiting our website please tell to your friends also about our site so that they can also increase there knowledge Remember us in your prayers.www.scienceandislam.yolasite.com

Studies related to marine sciences and sea depths did not practically start before the beginning of the eighteenth century, when appropriate instruments and techniques were available and when later advanced submarines were invented. After 1958, and as a result of three centuries of scientific studies and research by successive generations of oceanographers, man arrived at wonderful findings, such as the following:

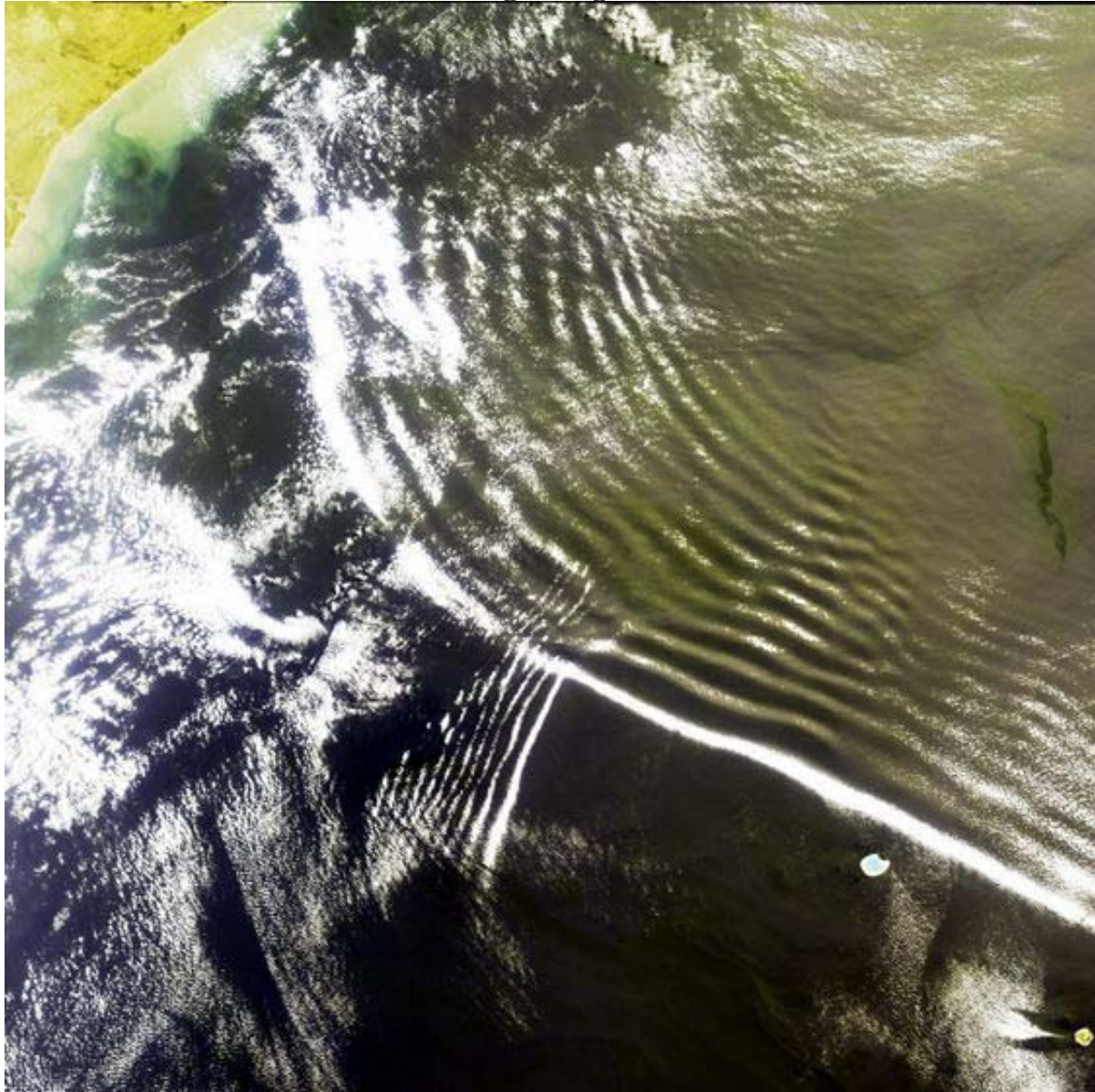
1. Sea divides into two major parts:

- The surface sea that is penetrated by the solar energy and light.
- The deep sea where the solar energy and light are non-existent.

2. The deep sea and surface sea differ in temperature, density, pressure, the amount of sun light and the creatures living in each of them. They are separated by internal waves.

3. Sea internal waves:

Internal waves cover the deep sea and serve as a boundary between the deep sea and the surface sea. Surface waves cover the sea surface and serve as a boundary between water and air. Internal waves were discovered in 1904. The lengths of internal waves range from tens to hundreds of kilometers. Their height ranges from 10 meters and 100 meters.



Satellite image of internal waves

Thanks for visiting our website please tell to your friends also about our site so that they can also increase there knowledge Remember us in your prayers.www.scienceandislam.yolasite.com

4. The deeper the sea the darker it becomes till it gets as dark as pitch from the depth of about (200) meters. At this depth there starts the thermocline that separates the warm surface waters from the cold waters of the deep. In it we find the internal waves that cover the cold water in the depth of the sea. Light disappears completely at the depth of 100 meters.

As for the darkness that overwhelms the deep, fishermen have realized that light is absorbed even in clear water and that the slopping sea bottom with its white sand changes its color gradually till it disappears completely at a certain depth. Light penetration is inversely proportional to depth. The simplest scientific instrument for measuring how deep light penetrates the ocean water is "the Secchi disc." Although this disc is an easy way to approximately measure the penetration of light into water and although it is widely used, the measurement of darkness in seawater was not achieved except after the use the photography at the end of the past century and the development of the devices of measuring the intensity of light that used the photoelectric cells during the thirties of the twentieth century, and after the invention of such equipment as made it possible to dive to these deep levels.

In the footnote there is more information on the intensity of light at different levels of the ocean.

In deep seas there are several layers of darkness, and light is non-existent in them. Living organisms and fish that live in them depend on chemical energy to produce light with which to find their way. Some species are blind and use means other than sight to sense their surroundings. Darkness begins at the depth of about 200 meters, and the entire visible light disappears at the depth of about 1000 meters. The structure of these fish is mostly water to withstand the enormous pressure.

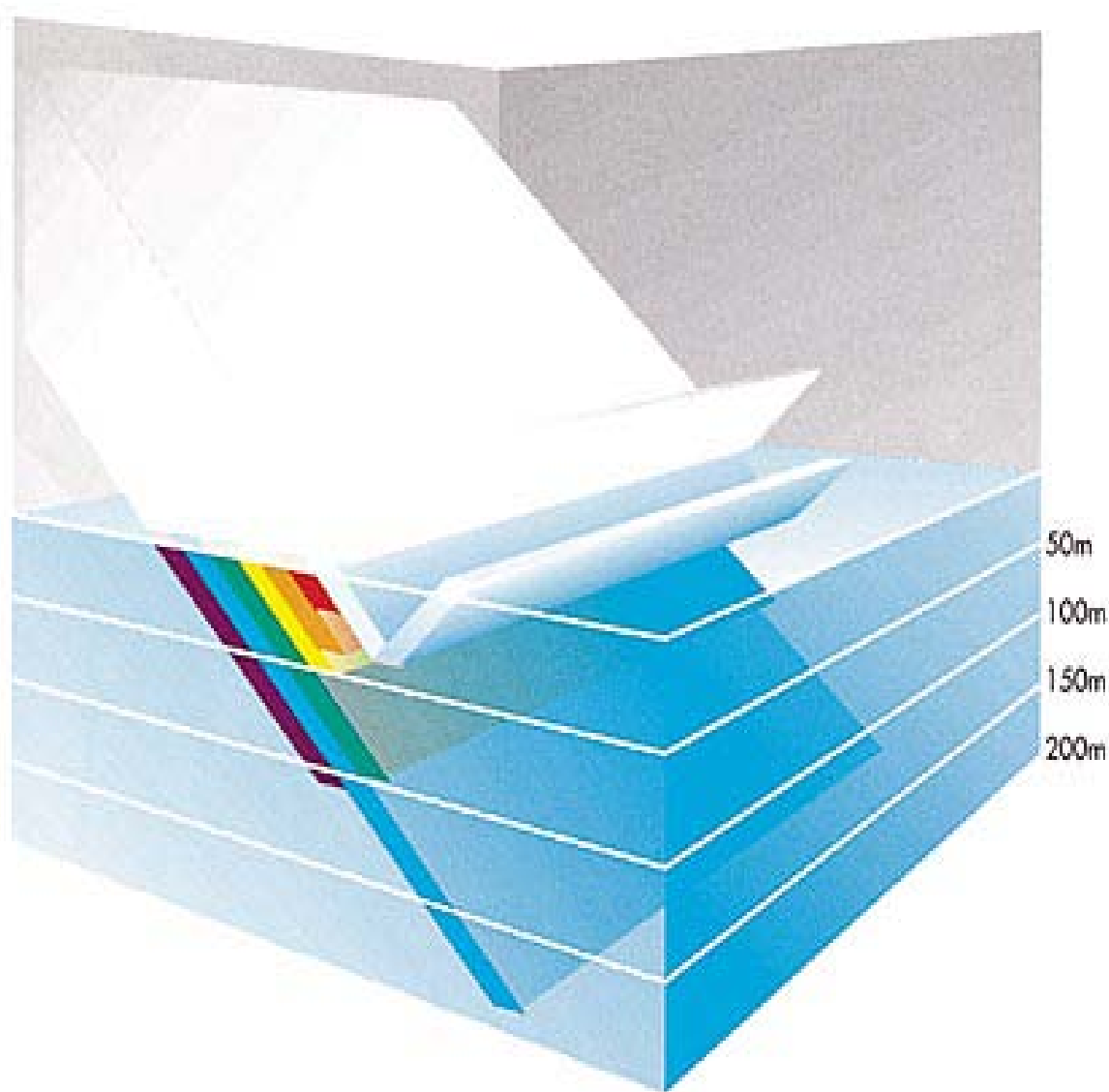
Layers of darkness one over the other:

The darkness that gets greater from the depth of 500 to 1000 meters takes place in the deep sea as a result of several layers of darkness topping one another because of two main factors:

The darkness of the colors of sunlight:

Sunlight consists of seven colors (red, orange, yellow, green, indigo, violet and blue). Each color has its own wavelength.

The penetration of light ray into water depends on its wavelength; the shorter the wavelength the deeper the light ray penetrates. The red color is absorbed at the depth of about 20 meters and then disappears. Consequently there appears the darkness of the red color. If a diver should be injured at the depth of about 25 meters and wanted to see the blood he would see it black because of the absence of the red color of the light. At the depth of about 30 meters the orange light is absorbed causing another type of darkness under the darkness of the red color, that is, the darkness of the orange color. At the depth of about 50 meters the yellow light is absorbed; at the depth of about 100 meters the green color is absorbed; at the depth of about 125 meters the violet and indigo colors are absorbed. The last color to be absorbed is the blue color at about 200 meters deep. Thus several layers of darkness of the colors of sunlight top one another because of the depth of water where colors are successively absorbed at different depths.



Between 3 and 30 percent of the sunlight is reflected at the sea surface. Then almost all of the seven colors of the light spectrum are absorbed one after another in the first 200 meters, except the blue light. (Oceans, Elder and Pernetta, p. 27.)

The Darkness of Barriers

The barrier darkness along with the color darkness contributes to the deep darkness in the deep sea. There are three types of barrier darkness:

a. The cloud darkness:

The surfaces of deep seas are often covered with clouds as a result of evaporation. Clouds partially obstruct sunlight and cause the first barrier darkness that is seen as shadow of these clouds on the earth and sea surface.

b. The darkness of surface waves:

The slopping surfaces of surface sea waves reflect sunlight. An observer at the seashore would notice the degree of the brilliance of the light reflected on these slopping surfaces of the surface waves.

c. The darkness of internal waves:

Thanks for visiting our website please tell to your friends also about our site so that they can also increase there knowledge Remember us in your prayers.www.scienceandislam.yolasite.com

Long, narrow sea surface slicks associated with internal waves are common features of exposed coastal environments. Such slicks, which may be accompanied by foam or debris, also have been shown to be associated with high concentrations of many types of planktonic organisms

Internal waves overwhelm and cover deep sea at the depth from 70 meters to 240 meters. Millions of millions of organisms are suspended on the surfaces of internal waves. An internal wave may extend to the sea surface where these organisms appear as dirt gathering together on the sea surface, which makes them along with the inclination of the internal waves an obstacle to prevent light from penetrating into the deep sea. Thus a third layer of darkness occurs under the cloud darkness and the darkness of the surface waves.

We conclude from what has been said that the layers of darkness in the deep are:

- a. Seven layers of darkness (the seven colors of the spectrum), which top one another.
- b. The three layers of barrier darkness 1) clouds 2) surface waves and 3) internal waves. They also top one another. Thus we have ten layers of darkness.



Fishes at this depth where there is complete darkness use there own light

Scientific Discoveries Related to the Verse

Thanks for visiting our website please tell to your friends also about our site so that they can also increase there knowledge Remember us in your prayers.www.scienceandislam.yolasite.com

Experimental science, over the last three centuries and as a result of the availability of precise instruments and the findings of a large number of researchers and oceanographers, has discovered the following facts:

- 1) There are layers of darkness in deep seas topping one another. Darkness gets more intense gradually till visibility is utterly impossible. There are internal waves that cover the deep sea. The internal waves with the organisms suspended on them prevent light from penetrating.
- 2) The layers of darkness accumulated on deep seas are ten: seven layers of darkness are caused by depth of waters, and three by barriers: clouds, surface waves and internal waves.
- 3) The waters of the seas are of two types:
 - The surface waters where light energy is found.
 - The waters of the deep over which layers of darkness are accumulated.

The Description of these Marine Secrets and Facts in the Holy Qur'an

Allah (SWT) says: *"Or (the unbelievers' state) is like the layers of darkness in a deep sea covered by waves topped by waves, topped by clouds: Layers of darkness, one above another. If a man stretches his hand, he can hardly see it. For any to whom Allah gives no light, there is no light."* (Quran 24: 40)

The Qur'an confirms the existence of layers of darkness in the deep sea. It describes the sea by the term "lujji" (deep) to emphasize that such layers of darkness are found only in deep seas, thus excluding the surface sea where such darkness is non-existent.

Linguists and Commentators explained the meaning of "lujji". Qatadah and the author of al-Jalalain said: "Lujji" means "deep". Al-Zamakhshari said: "'Lujji' means deep and with large amounts of water." Al-Tabari said: "Describing the sea as 'lujji' indicates its depth and abundance of water in it." Al-Bashiri said: "It refers to something the bottom of which cannot be sounded."



Such layers of darkness form because of the depth the deep (lujji) sea. They are the layers of darkness mentioned above. Allah (SWT) says: *"Or like the layers of darkness in a deep sea"*. Al-Zamakhshari said; "Accumulated layers of darkness because of the depth of the sea, the waves and the clouds." Al-Khazin said: *"'Or like the layers of darkness in a lujji sea'* means 'deep and with abundant water...' which means that the lujji sea has a very dark bottom because of the depth of water."

The Qur'an mentions that the deep sea is covered by waves: *"Or like the layers of darkness in a lujji sea topped by waves"*. The Verse mentions that there are other waves atop the first waves. Allah (SWT) says: *"covered by waves topped by waves..."* This is a characteristic of the sea in that it has two types of waves atop one another. They are not successive waves in one place but simultaneous waves, the second type atop the first. The verse states that over these waves, which cover the deep sea, there are other waves. Allah (SWT) says: *"topped by clouds."* These other waves are none but the waves at the surface of the sea that must cover the first waves.

The verse states that the superiority of the second waves over the first waves is like the superiority of the clouds over the second waves. Allah (SWT) says: *"covered by waves topped by waves, topped by clouds..."*

Thanks for visiting our website please tell to your friends also about our site so that they can also increase their knowledge Remember us in your prayers. www.scienceandislam.yolasite.com

The Verse mentions that there are waves covering the deep sea and also other waves that top the first waves, which entails the existence of a sea over the first waves and the deep sea, i.e. the surface sea that covers the second waves that are topped by clouds.

The Qur'an confirms the role of these three barriers in forming the successive layers of darkness in the deep sea and that they are atop each other, as Allah (SWT) says: *"covered by waves topped by waves, topped by clouds: Layers of darkness, one above another...."* This is what some Commentators understood. Al-Imam al-Baghawi, interpreting the Verse, said: "The darkness of the first waves over that of the sea, and the darkness of the second waves over the first waves, and the darkness of the clouds over that of the second waves." Al-Imam Ibn al-Jawzi, in his commentary, says: "Layers of darkness mean the darkness of the sea, the darkness of the first waves, the darkness of the waves that top the other waves, and the darkness caused by the clouds."

The verse refers first to the seven layers of darkness in the deep and to the three layers of darkness caused by barriers at last: *"Or like the layers of darkness in a deep sea covered by waves topped by waves, topped by clouds: Layers of darkness, one above another...."*

The verse states that the above-mentioned layers of darkness caused by the depths or the barriers are atop each other. The Qur'an uses the Arabic term "Zulumat" (pl. of Zulma) "a layer of darkness" which is a plural form that is used to indicate a number between 3 and 10. This indicates that the successive layers of darkness in the deep sea are between 3 and 10. This is verified by modern science, as we have mentioned: 7 layers of darkness created by colors as a result of depths and three layers caused by barriers (internal waves, surface waves and clouds).

The verse demonstrates the gradual intensity of darkness in deep seas by using the Arabic word meaning "hardly" *"If a man stretches out his hand, he can hardly see it"* which makes the expression carry two likely meanings: First: the person who stretches out his hand in these depths to look at it will not see it but with the greatest difficulty, (according to some commentators, such as al-Mubarrid and al-Tabari. Second: such a man will not see it at all (according to some other commentators, such as al-Zajjaj, Abu 'Ubaidah, al-Farra' and al-Naysaburi. Both interpretations are relevant, for one is true for depths closer to the surface and the other is true for depths reaching about 1000 meters, as has been stated above. See how a concise Qur'anic expression carries several correct meanings!

The Aspect of the Miracle

The Holy Qur'an mentions precise information about the layers of darkness in the deep sea. It refers to the causes underlying their formation and their arrangement atop each other. Man could not know of these layers of darkness until after 1930 AD. The Qur'an informs us of the existence of internal waves in the seas, a fact unknown to people before 1900 AD. It informs us that the internal waves cover the deep sea, a fact discovered only after the invention and use of submarines in the thirties of the twentieth century. The Qur'an also discloses the role of the surface waves and internal waves in creating the layers of darkness in the deep sea, a matter known only with the scientific advances in the later centuries.

The above-mentioned pieces of information and knowledge were not discovered by man except after he had invented such instruments of scientific research as enabled him to reach these depths and study these phenomena, and after a long period of research extending for three centuries during which hundreds of researchers and investigators worked hard to discover these facts. Who then informed Mohammed (Peace be upon him) of these secrets of the deep sea at a time when the means of scientific research were non-existent, and superstitions and myths were prevalent worldwide, particularly, in the marine field! How did these precise secrets reach this illiterate man, who lived among an illiterate nation and a desert environment, and who never sailed the sea throughout his life?

When these facts were presented to Professor Rao and was asked his opinion on the phenomenon of the scientific miracles in the Qur'an and the Sunnah and how it was possible for Muhammad (peace be upon him) to inform of these facts fourteen centuries ago, he said: "It is difficult to imagine that this type of knowledge existed at that time around 1400 years back. Maybe some of the things they had simple ideas about, but to describe those things in great detail is very difficult. So, this is definitely not a simple

human knowledge. A normal human being cannot explain this phenomenon in that much detail. So, I thought the information must have come from a supernatural source."

This is crucial evidence that the knowledge conveyed by the Qur'anic verse has been revealed by Allah, Who knows the secrets of heaven and earth. Allah (SWT) says: *"Say: It (the Qura'n) was sent down by Him Who knows the secret (that is) in the heavens and the earth: Verily He is oft-Forgiving, Most Merciful."* (Quran 25: 6) Allah (SWT) also says: *"But Allah bears witness that what He has sent to you He has sent from his (own) knowledge, and the angels bear witness: but Allah is enough for witness."* (Quran 4: 166) Allah (SWT) also says: *"Soon will We show them Our Signs in the (furthest) regions (of the earth), and in their own selves, until it becomes manifest to them that this is the truth. Is it not enough that your Lord does witness all things?"* (Quran 41: 53)

Earth