AL KITAB
The Renaissance Project

Chapter 11

Water

Mohamed Al Qadhi

Water

On August 6th 2012, Curiosity would take man to another planet once more. Off course, I do not speak of the human emotion we call curiosity, but of the manmade rover NASA had amply called “Curiosity”, which on that day, finally landed on Mars’ surface.

It took years of hard work and over 2 Billion Dollars to finally do so, a huge sum of money considering the fragile state of the US and global economy. To what important purpose does Curiosity aspire to? An objective that must be of grave importance, I am sure you would agree, for the US government more so than ever before, is accountable for every penny it spends.

The answer - Curiosity is seeking to answer many questions about our neighboring planet, the most important and most cited of which is the question of water. Does Mars have any water on its surface? Is there any evidence that water existed in its past?

These questions are being answered as we speak, but to such questions I propose a question of my own: why are we so interested to find out?

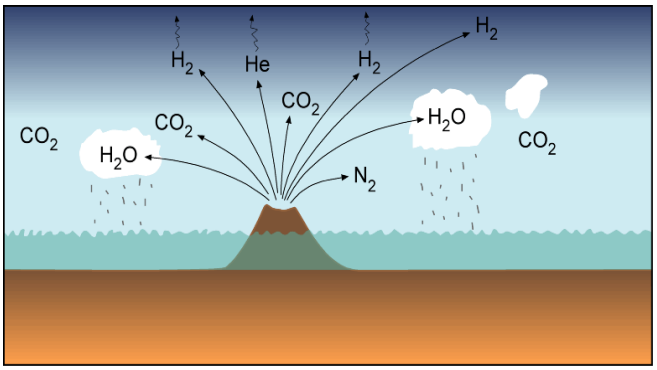
It is quite simple: the existence of water is a critical piece of evidence to determine whether life existed, exists, or will exist on Mars. Simply put, without water, there would be no life. This fact is so entrenched in our overall understanding of the world that it is never seriously questioned. Organisms, no matter how big or small they are, are utterly reliant on water. For example, our bodies are predominantly made up of water, an estimated 60%(1) . Similarly, evolution theories rely heavily on the idea that life first developed in the Earth’s oceans. There is simply no substitute for it. It is indeed a unique compound with exceptional characteristics.

How fortunate are we thus, to exist in a world that enjoys its abundance like no other? For Earth, often called “the Blue Planet”, is largely covered by water; around 71% of its surface. But where did all this liquid water come from?

There are two prominent theories that could explain this phenomenon. The first assumes that Comets are the source of most of the water we see today. Comets are small objects lingering in outer space and are made of dust, ice, and other compounds. We know our planet was heavily bombarded by these objects billions of years ago. The comets would have released a large amount of water vapor upon impact, and assuming there were enough of them, they would have generated sufficient water vapor to form most of the Earth’s oceans.

The second theory adopts a very different position. It presumes that the water came from within the Earth. The theory suggests that when the Earth first formed, much of its water had already existed within its deeper layers only to escape to its surface later on. This phenomena is called volcanic outgassing (see Figure11.1) and it is often cited as the driving force behind the formation of our atmosphere and oceans.

Figure 11.1 Volcanic Outgassing



Volcanic Outgassing – The Science

During the Earth’s infant years, volcanic activity was very common. Great volcanoes would viciously erupt across our planet. This volcanic hegemony would continue for millions of years and would allow huge sums of precious minerals, carbon dioxide, and water vapor to escape the Earth’s interior in the form of volcanic ash, gas, and rocks. The importance of such events cannot be understated. Minerals have always been a crucial element to our lives and our economies, carbon dioxide was critical to the formation of our atmosphere, and more importantly, the water vapor that would escape resulted in the formation of much of the water we see today.

Notes (1): Measured by Weight – Franzese and Stanley – Understanding the Unusual Properties of Water

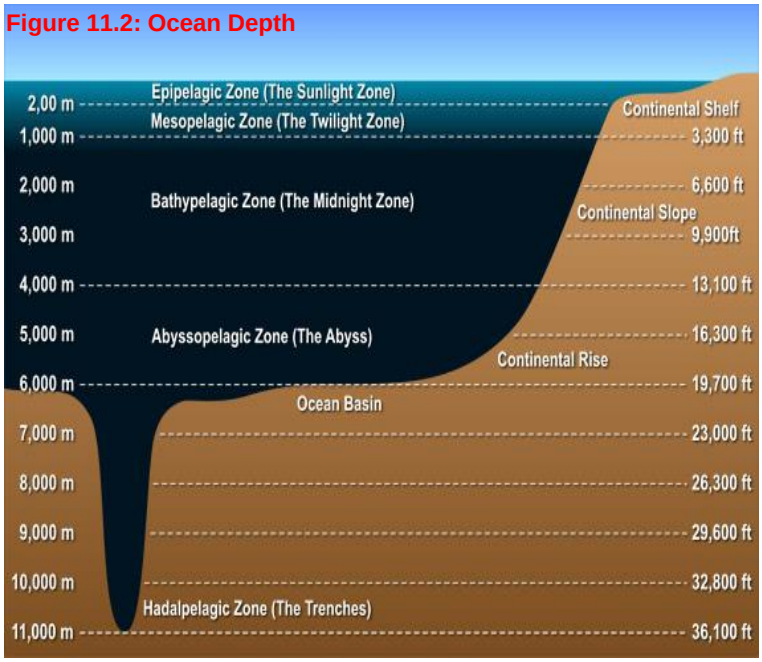
The Deep Ocean

The oceans that formed thereafter are vast. They cover most of the Earth's surface, extending to more than 11km in depth. Unfortunately, we know very little of the world that exists in our waters. An estimated 1-50 million species haven't been discovered yet and many of the Earth's secrets are thought to be hidden away on the ocean's bottom floor. This situation is unlikely to change in the near future; the conditions that persist at the oceans depths are hostile. Furthermore, exploring these areas is extremely costly.

Such a challenge to our knowledge has motivated many to study our oceans, among which is Bob, our now retired astronaut who seeks a new career. Abandoning his space flight dreams, he decides to explore the ocean. In his first mission, Bob aims to visit the ocean floor below and discover its secrets.

At first, Bob can't help but appreciate the beauty of the ocean. Its blue color reminds him of the blue skies he grew so accustomed to (see Ray Light Scattering Chapter 7). As he begins to descend deeper (200m), Bob starts noticing that his surroundings are getting darker. There is less light and he finds it more difficult to see. Descending even further, Bob becomes increasingly agitated. Finally, at around 1000m, Bob can no longer tolerate his mission; he can no longer see his own hands! The ocean at this depth is pitch black without a hint of light. With no visibility what so ever, a frightened Bob abandons his quest and heads back towards the surface.

Figure 11.2: Ocean Depth



Did you know?

The deepest known spots in the ocean are in the trenches of the Southwest Pacific Ocean which are more than 11km deep

The story of Bob highlights a very important characteristic of our ocean. It can be divided into three main layers based on light penetration (See Figure 11.2). The first layer stretches from the surface of the ocean to ~200 meters deep. It is the layer we are most familiar with and has enough light penetrating it to allow some visibility under water. The layer is called the epipelagic, photic or euphotic zone.

The second layer stretches to ~1,000 meters and is extremely dim. Most of the sun light cannot penetrate to these depths. This dim layer is often referred to as the twilight zone or the mesopelagic zone in scientific terms.

Below the twilight zone, the ocean is pitch black. No sun light penetrates at these depths. As Bob found out, without an external light source, one cannot even see one's own limbs. This layer is called the midnight zone or the Bathypelagic Zone in Scientific terms, and past 4,000 meters deep, is called the Abyss or the Abyssopelagic Zone in Scientific Terms.

In this chapter, we looked at the most important element of the ancient world: Water. We looked at its role in creating and sustaining life, its origin here on Earth, and some of the ocean's key characteristics. This is by no means an exhaustive list. There are thousands of wonderful stories and characteristics found in water and water worlds that haven't been discussed here. However, it is the characteristics we explored in this chapter that interest us in our study as they are referred to in the Quran. Let us explore whether scientific theories on water are aligned to the Quran's revelation.

Water in the Quran

1 *Water and Life*

In the highly touted book “Water and Life – The Unique Properties of H2O”, a team of experts explore the delicate and complex relationship between life and water. It is determined that water is a unique compound with abnormal anomalies that make it the perfect suitor to the creation and sustainability of life. In fact, life as we know it cannot be envisioned without water as there is no direct substitute for it. Any notion of life developing without water is extremely unlikely and based on nothing more than speculative / philosophical scenarios. Though other liquids may have some of water’s beneficial characteristics, none are able to combine all of its unique features, all of which are essential to life. From its polarity to its hydrogen bonds, it is simply one of a kind.

Of water’s proven role in the development of life, the Quran states:

”أَوَلَمْ يَرَ الَّذِينَ كَفَرُوا أَنَّ السَّمَاوَاتِ وَالْأَرْضَ كَانَتَا رَتْقًا فَفَتَقْنَاهُمَا ۖ وَجَعَلْنَا مِنَ الْمَاءِ كُلَّ شَيْءٍ حَيٍّ ۖ أَفَلَا يُؤْمِنُونَ“ (21,30)

Have the unbelievers not seen that Heavens and the Earth were one piece, then we separated them? And of water we produced every living thing? Will they not believe then?

The word “من" means from; Allah states that “from water” all living things came to be. This sits perfectly well with recent scientific discoveries. As mentioned earlier, water was a critical element in the development of life. Furthermore, if “from” in this instance is meant to convey a place (life came from water – water being a place), then this also sits perfectly well with evolution theories which presuppose that life started in our oceans.

What makes this verse all the more extraordinary is that it combines revelations about the origin of the Universe (See Big Bang Chapter 2) and the origin of life. It then poses a question; now that I have revealed the origin of the Universe and of life 1400 years before scientific discovery, will you believe that this book may very well be divine in nature? Will you not believe then?

Below, another verse on water’s role in the creation of life

”وَٱللَّهُ خَلَقَ كُلَّ دَآبَّةٍ مِّن مَّآءٍ ۖ“ (24,45)

Allah hath created every animal from water

2 *Origin of Water on Earth*

The Quran’s statements on water are not limited to the above. As discussed in the previous section, many scientists agree that a large percentage of Earth’s water came from the planet’s interior layers. Water and minerals trapped inside the earth escaped to the surface through volcano eruptions. The water would escape in the form of water vapor (a gas) and would eventually cool down, return to the surface through rain showers and form much of the oceans and seas we see today.

Of Earth’s water source, the Quran mentions:

”أَخْرَجَ مِنْهَا مَاءَهَا وَمَرْعَاهَا“ (79,31)

From it (Earth), He brought out its water and its pastures

Oceans in the Quran

The verse provides a very accurate description of volcanic outgassing. One must understand that the idea of volcanic outgassing being responsible for most of our water is a uniquely modern idea. Traditionally, the more sensible approach would have been to suppose that Earth was created this way; the water having always covered the Earth's surface. Instead, the Quran chose to attribute its origins to the Earth's interior layers after which it was extracted to the surface.

3 *Oceans and Light*

Finally, we have discussed how light cannot penetrate the ocean's depths with Bob struggling to see his own limbs. Of this, the Quran states

(24,40) "أَوْ كَظُلُمَاتٍ فِي بَحْرٍ لُجِّيٍّ يَغْشَاهُ مَوْجٌ مِنْ فَوْقِهِ مَوْجٌ مِنْ فَوْقِهِ سَحَابٌ ۚ ظُلُمَاتٌ بَعْضُهَا فَوْقَ بَعْضٍ إِذَا أَخْرَجَ يَدَهُ لَمْ يَكَدْ يَرَاهَا ۗ وَمَنْ لَمْ يَجْعَلِ اللَّهُ لَهُ نُورًا فَمَا لَهُ مِنْ نُورٍ"

Or (the Unbelievers' state) is like the depths of darkness in a vast deep ocean covered by waves upon waves above which are clouds: depths of darkness one above another: if a man stretches out his hand, he can hardly see it! And the one to whom Allah does not give light can have no light at all!

The description found in this verse is incredible. Once again, the Quran combines brilliant literature and future knowledge in one verse that never fails to overwhelm the reader. From a scientific perspective, how can one explain knowledge of the deep sea? How can one describe it so accurately without the means of being there? Is a skeptic truly as blind as a man plunged into deep layers of the ocean? Is belief the light that brings clarity?

I cannot answer such questions but it is apparent that the knowledge expressed in the Quran, whether it's this verse, the verses examined in this chapter, or this entire volume is mind blowing and utterly magnificent.

With this I bring Part 2 of this Volume to a close. Having discovered some of the astronomical and earthly secrets expressed in this ancient document (Quran), I will now move to the last Part which focuses on organisms and human beings. How will the Quran stand against modern scientific knowledge in this field?

Primary Sources

- Lynden-Bell, Morris, Barrow, Finney, and Harper: Water and Life, The Unique Properties of H20
- Carlson, Palmer, Hammersley: Physical Geology, Earth Revealed
- Dr Maurice Bucaille: The Bible, The Qur'an, and Science
- Ellen Prager, The Oceans
- Mark Garlick: The Story of the Solar System (Cambridge University Press, 2002)
- Geoff Rauner-Canham and Tina Overton: Descriptive Inorganic Chemistry (W.H. Freeman and Company, 2010)
- NASA Education
- National Geographic Education
- Douglas Palmer: Earth in 100 groundbreaking discoveries
- Cesare Emilliani: Cosmology, Geology, and the Evolution of Life and Environment
- Dr Zaghlul Najar: Al Ard in the Quran
- Dr Zaghlul Najar: Mokhtarat Min Tafseer Ayat Al Kawniya Fi Al Quran Al Kareem
- Majid Fakhry: The Quran, A Modern English Version
- Roohi Baalbaki, Al-Mawrid (Dar El-ILM LiLMALAYEEN)
- The Holy Quran
- Ibn Katheer – Tafseer Al Quran
- Mohamed Pickthall: The Meaning of the Glorious Quran

Photo and Figure Sources

- Figure 11.1 Photo Credit: Nokia Mobile Paper
- Figure 11.2 Photo Credit: Columbia University, Origin of the Universe and Earth
- Figure 11.3 Photo Credit: Sea and Sky Organization

Editors

I would like to thank all the individuals that helped contribute to the production of this Chapter. Special thanks to Haya El Assi Al Shammaa for her insight and review