

# Nabataean water supply systems between the 1<sup>st</sup> century B.C. and the 1<sup>st</sup> century A.D.

Nabataean civilisation and the topic of their technology has been a subject of debate as long as the re-discovery of the ancient city of Petra in 1803 by Johann Ludwig Burckhardt.

The Nabataeans thrived in the deserted regions of today's Israeli and Jordanian deserts by the usage of an elaborate water supply technology that was perfectly suited for their idea of life in the hostile environment. Water tanks and cisterns hidden in plain sight accumulated water during rainstorms. The same water was later used by travelling Bedouins. Their travel frequently involved conquering thousands of kilometres in order to exchange goods, considered exotic and high in value. The knowledge of hidden water basins and their water storing capabilities gave them a rather big advantage in terms of speed and travel safety. This work aims to describe the ideas and technology that the Nabataeans acquired, additionally trying to identify the source of those ideas whether to pin point their origin as completely self-created or largely influenced from different earlier existing cultures.

The Nabataean Kingdom was established during the early 1<sup>st</sup> century B.C. as a conglomerate of nomadic tribes that engaged in the so-called Frankincense trade. During its lifetime, it became one of the most prominent players on the political and economic spectrum of the Arabian world. Described by Strabo in his *Geographica* as a tribe of wealthy desert farmers the Nabataeans became Roman vassals sometime in the 1<sup>st</sup> century B.C. until the kingdom was disbanded after the death of its last monarch Rabbel the second in the year of 107 A.D.

Organised society became even more creative and further advanced their technology. The entire mountainside of the city in Rock called by the ancients Petra was transformed by skilled architects to work as a water collecting vessel. Several tunnels and aqueducts were created for this sole purpose. The world-famous tourist attraction – The Petrean Siq is one of the fruits of this enterprise.

Presented paper was divided into several different chapters with the aim of presenting the Nabataean tribe, its history and technological advancements in the field of water gathering and distribution to provide a greater context of its importance for this region.

One chapter focused on the history of the archaeological framework done during the almost 200 years of European re-discovery of the region. Divided into two significant sections with focuses on different time periods of Arabian archaeology. The explorers section describes the bios of the most prominent early explorers of the region like Johann Ludwig Burckhardt, Alois Musil and Thomas Edward Lawrence. All of them thoroughly engaged in the history and lifestyle of the region. Second part engages with the work of more modern archaeologists whose fields of expertise include Nabataean water supply technologies but also a different and wider spectrum of additional archaeological work.

Sections on climate and geology provide additional understanding on how the Nabataean technology utilizes the natural properties of rocks and soil.

Chapter called "Water Management Systems in different time periods of the Nabataean Kingdom" provides a breakdown of known Nabataean technology between the 4<sup>th</sup> century B.C. and the 4<sup>th</sup> century A.D. Starting from the Early Bronze Age where we can find traces of people setting up different technological ideas for water capture. Beginning with the usual rock cut ponds that were

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very prone to water evaporation like the Thamila till the more advanced concepts like wadi terracing and underground water tunnels. With the beginning of the Iron Age technological advancement appeared in the shape of an upgrade that has been done to the water collection basins. Cisterns and water reservoirs littered the desert. Cut in the bedrock and waterproofed by hydraulic mortar they could have stored water for several months. This became a serious breakthrough for the prosperity of the later Nabataean people.

Sabaeen chapter focuses on a short history of the Sabaeen people. A trading nation very much like the Nabataeans. They inhabited the region of today's country of Yemen and engaged in the very profitable frankincense trade. Growing of the frankincense trees and trying to live in a very hostile environment of the Arabian Peninsula desert prompted the industrious Sabaeans to create and further develop their own water supply technology. Many of such constructions like to world famous Ma'rib Dam stands as a testament to that notion. Many of the Negev and Jordanian desert Bedouins engaged in desert faring trade with the Sabaeans. Their frequent excursions could be one of the elements that weighted very heavily on their knowledge of water supply facilities.

Further Chapters go in depth about the water supply technology that the Nabataeans used and further developed over the years. Explaining the intricacies of how do they work and presenting their probable roots. The last chapter consists of Archaeological evidence segregated by country (Israel or Jordan) presenting the most important sites for the Nabataean culture.

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