Olivine in the Ancient World

Fathi Habashi
OLIVINE IN THE ANCIENT WORLD

Olivino en el Mundo Antiguo

Fathi Habashi
Department of Mining, Metallurgical, and Materials Engineering
Laval University, Quebec City, Canada
Fathi.Habashi@arul.ulaval.ca

RESUMEN

Los olivinos de la isla de Zabargad, en el Mar Rojo, fueron explotados desde muy antiguo. También se encontraron en áreas vecinas, desde Berenice a Marsa Alam. Las minas están agotadas y esta área es actualmente una atracción turística, de buceo, debido a sus restos antiguos y a la gran cantidad de corales que se encuentran cerca de la costa.

PALABRAS CLAVE: Topacio, esmeralda, Zabargad, Berenice, Marsa Alam, Ras Banas, fosterita, fayalita, comercio.

ABSTRACT

Gemstone samples of olivine discovered in Zabargad Island off the coast of Egypt on the Red Sea was mined since ancient times. It was found also in the neighbourhood area from Berenice to Marsa Alam. The mines are exhausted and the area is now a tourist attraction because ancient remains, of sea diving, and the plenty of corals near the coast.

KEY WORDS: Topaz, emerald, Zabargad, Berenice, Marsa Alam, Ras Banas, fosterite, fayalite, trade.

Recibido: 7 de noviembre, 2015 ● Aceptado: 10 de diciembre, 2015

INTRODUCTION

Pliny the Elder (23-79 AD), mentioned the island “Topazios” in his work Naturalis Historia where gemstones were found whose color resembled that of olive oil. In 1790, the German mineralogist Abraham Gottlob Werner (1749-1817) (Fig. 1) named the mineral olivine (Fig. 2) because of its typical olive-green color. This happened when in the early 18th century the name topaz was given to the fluoro-bearing aluminum silicate and a new name was needed for the green gemstone from volcanic Zabargad Island in Egypt (Figs 3 and 4) where the gemstone was discovered.

Figure 1. Abraham Gottlob Werner (1749-1817).

Figure 2. Raw olivine.
The Persian scholar Al-Biruni (973-1048) (figure 5 in his work *The Book Most Comprehensive in Knowledge on Precious Stones* stated that “zamarrud” (emerald) and “zabarjad” (olivine) were two names for the same thing. It is quite possible that Al-Biruni reflects the general view of the time that the olivine of Zabargad was traded as emeralds. In Europe, there are indications that gems from Zabaragad were available on the market during this period, and were also called emerald.

Transparent olivine is used as a gemstone also called peridot by French mineralogists (Fig. 6). According to ancient Greek and Roman writers the ancient Egyptians were the first to mine for gemstone. The largest olivine is 319 carats was found in that island and is exhibited at the Smithsonian Institution in Washington, DC.

THE NATURE OF OLIVINE

Olivine is one of the most common minerals in the earth, and is a major rock forming mineral. It is thought to be an important mineral in Earth’s mantle since it is present in pieces of the upper mantle delivered to Earth’s surface in the magmas of volcanic eruptions. Despite this, good specimens and large crystals of gem quality are uncommon. Only few localities yield large examples of this mineral. Olivine is a solid solution: forsterite, $\text{Mg}_2\text{SiO}_4$, and fayalite, $\text{Fe}_2\text{SiO}_4$ (Fig. 7) which can be represented as $(\text{Mg}^{2+}\text{Fe}^{2+})_2\text{SiO}_4$. Manganese and nickel are commonly present.
OLIVINE IN ANCIENT EGYPT

Olivine was found in south of Egypt on the Red Sea shores in Berinice, Marsa Alam, and in the Zabargad Island off the Peninsula of Ras Banas. It is believed that mining activities started in this region by the ancient Egyptians. It was also nearby at Mons Porphyrites (Mountain of Porphyry) at Jebel Abu Dukhan that an extensive Roman mining operation of the pinkish-purple porphyry granite which was used in temples, baths, sarcophagi, and statues that was shipped to Rome.

Zabargad Island

Some of best gem-quality olivine has been obtained in ancient times from Zabargad Island now called St. John’s Island. The Island is 3.2 x 2.4 km near coral reefs. During the years before World War I olivine on the island was monopolized by the Khedive of Egypt. Drinking water for the miners was obtained by erecting a large gasoline-powered water condenser of which a few rusty parts are still lying around today. In 1922 the Egyptian government gave the mining rights to the Red Sea Mining Company. In the years that followed, until the outbreak of World War II, this company brought out a considerable amount of olivine. In 1958, the deposits were nationalized by Egyptian President Nasser.

In 1980 Gübelin visited the island and reported that there was no fresh water and hardly any life. Apart from low-growing shrubs, several giant turtles, and a few birds such as wagtails, ospreys, and gulls there is practically no flora or fauna. He found however an olivine mine and was able to collect some precious stones (Fig. 8).

Figure 8. An olivine mine on Zabargad Island [Gübelin].

According to Gübelin the occurrence of olivine on Zabargad is related to the tectonic processes that on a larger scale were responsible for the formation of the Red Sea itself. The rocks seen on the island represent the results of magmatic activity with associated metamorphism of pre-existing sediments. Gübelin also noted the old mines waste heaps. Shortly before his visit a joint American-Austrian expedition consisting of curators from the Vienna Museum of Natural History and the American Museum of Natural History in cooperation with the Egyptian Geological Survey, and with the help of the El Nasr Phosphate Company, spent several days on the island.

Berenice

Berenice is situated as the latitude of Aswan was founded in 275 BC by Ptolemy II Philadelphos (285 BC-246 BC) and named it after his mother Queen Berenice I (ca. 340 BC-ca. 268 BC) (Fig. 9). In the Roman period Berenice was the center of trade in spices, myrrh, frankincense, pearls, and textiles imported from Arabia and India and were then shipped to Alexandria and Rome (Fig. 10).

There are ruins of several olivine mines in operation since Pharaonic times until the Roman era (Fig. 11). The emperor Hadrian erected the Temple of Serapis (Fig. 12) and a stele discovered in 1823 indicates that there was a Christian church. In 2015 a Polish Expedition discovered an ancient Egyptian stele (Fig. 13). Other findings include three burials from the Roman era, along with parts of the facade of the temple of Queen Berenice. The Romans also built a fort, stables, cisterns and wells. From 1980’s onwards it is now the leading resort along the Red Sea coast.
Mount Smaragdus in Marsa Alam, the modern Djebel Zabareh, derived its name from the emeralds [olivine] found there where remains of ancient mining operations from Pharaonic to Roman times can be found (Fig. 14). Marsa Alam has also the Temple of Seti I (1305-1290 BC) (Fig. 15) discovered and unearthed by Belzoni in 1818. An ancient well is also located in close proximity to the temple. The Arabs worked on these mines but the work ceased in the year 1370. Later on in the 19 century there was an attempt to re-open the project but it proved futile. The ancient Sukari gold mine is about 23 km south-west of Marsa Alam. It started operation recently. An International Airport was inaugurated 2003 (Fig. 16).

SUGGESTED READINGS