

# The stones of the statuary of the Egyptian Museum of Torino (Italy): geologic and petrographic characterization

A. Borghi<sup>1</sup> · D. Angelici<sup>1</sup> · M. Borla<sup>2</sup> · D. Castelli<sup>1</sup> · A. d'Atri<sup>1</sup> · G. Gariani<sup>3</sup> ·  
A. Lo Giudice<sup>3</sup> · L. Martire<sup>1</sup> · A. Re<sup>3</sup> · G. Vaggelli<sup>4</sup>

Received: 19 December 2014 / Accepted: 7 May 2015  
© Accademia Nazionale dei Lincei 2015

**Abstract** A geologic and petrographic study was performed on a rich collection of statues made of stone exposed at the statuary of the Egyptian Museum of Turin (NW Italy) to enhance the value of this artistic heritage and set the basis for its best conservation. Magmatic and sedimentary rocks were recognized. Magmatic rocks with an intrusive origin are the most represented and include two main varieties: Red Granite, consisting of a sienogranite with porphyritic texture and pink to red K-feldspars, and Black Granite, which includes granodiorite, quartz diorite and tonalite lithotypes, whose colour ranges from grey to almost black. These magmatic rocks belong to the Arabian–Nubian shield, and the historical quarries are located near Aswan. The sedimentary rocks are represented

by Cenozoic white limestones and red sandstones and Cretaceous dark-yellow Nubian sandstones. Finally, we note the occurrence of the so-called Bekhen Stone, originally attributed to a green-black metagreywacke belonging to the Hammamat series of late Precambrian age, outcropping in the central sector of the Eastern Desert, and re-interpreted here as a massive dark-green sandstone. This paper provides a scientific classification of the artefacts exposed in the statuary rooms based on the employed materials and contributes to the enhancement of the valuable collection of stone artefacts preserved in one of the leading ancient Egyptian Museums in the world.

**Keywords** Applied petrography · Cultural heritage · Archaeometry · Ancient Egyptians

---

This contribution is the extended, peer reviewed version of a paper presented at the session “Archaeometry and Cultural Heritage: the contribution of Geosciences” held during the conference “The future of the Italian Geosciences, the Italian Geosciences of the future”, organized by the Società Geologica Italiana and the Società Italiana di Mineralogia e Petrologia, Milano, September 10–12, 2014.

---

This paper is dedicated to the memory of Margherita Serra whose youthful enthusiasm was incentive to continue archeometric studies.

---

✉ A. Borghi  
alessandro.borghi@unito.it

- <sup>1</sup> Dipartimento di Scienze della Terra, Università di Torino, V. Valperga Caluso 35, 10125 Turin, Italy
- <sup>2</sup> Soprintendenza per i Beni Archeologici del Piemonte e del Museo Antichità Egizie, Piazza San Giovanni 2, 10122 Turin, Italy
- <sup>3</sup> Dipartimento di Fisica, Università di Torino, Via P. Giuria 1, 10125 Turin, Italy
- <sup>4</sup> C.N.R. Istituto Geoscienze e Georisorse Torino, V. Valperga Caluso 35, 10125 Turin, Italy

## 1 Introduction

The Mediterranean Basin and the surrounding countries represent a geographic area with a high concentration of natural stones employed by humans since the earliest times in history (Lazzarini 2004). In this context, Egyptian stones are of primary importance among all of the natural stones used in various historical epochs, including both the wide use by the ancient Egyptians and the following use in Roman times (Harrell 1989). The ancient Egyptians had a significant knowledge of rock features and laid the bases for stone quarrying and working. Rocks with different geologic histories and different chemical–mineralogical compositions represent a unique cultural heritage (Klemm and Klemm 2001).

Their mineralogical and petrographic characterization is, therefore, a fundamental step in the valorization of materials that are important from a historical and artistic