

# **Marmora Asiatica.**

## **Polish Studies on Marbles from Asia Minor**

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The Institute of Archaeology of the University of Warsaw (today Faculty of Archaeology) has launched the interdisciplinary project “Marmora Asiatica. Towards Archaeopetrology in Poland”. This project is intended as an archaeo-geological investigation, whose main goal is to document white and grey/black marble quarries of Antiquity in Asia Minor.

The long-term research programme is intended as an international collaboration between Classical archaeologists, geologists, and material culture experts from Poland, Turkey, Italy, and the United States. It is financed by the National Science Centre of the Republic of Poland (decision number DEC-2012/07/E/HS3/03971), and is supported by the Ministry of Culture and Tourism of the Republic of Turkey, as well as by the General Directorate of Mineral Research and Exploration of the Republic of Turkey.

Thus far, the joint mission has carried out four seasons of field reconnaissance. The first, in 2014, focused on the quarries of İsehisar (or ancient Dokimeion) in the province of Afyonkarahisar, and the quarries of Göktepe in the province of Muğla. In 2015, during the second season of fieldwork, the quarries of the ancient city of Aphrodisias in the province of Aydın, and those of Altıntaş in the province of Kütahya were researched. In 2016, we surveyed Marmara Island (ancient Prokonnesos) in the province of Balıkesir, and finally, in 2017, the quarries located in the territories of Ephesus in the province of İzmir.

The fieldwork consisted of three separate components: systematic geological and archaeological investigation, mapping, and an extensive sampling program.

With the goal of locating and recording as many quarries as possible, we used the published results of previously conducted fieldwork and satellite imagery.<sup>1</sup> The mapping of the quarries was done with a total station and GPS-equipment, although the most important and useful tool for this kind of documentation was a 3-D laser scanner. The scanner allowed us to estimate the volume of stone extracted and to make accurate three-dimensional models of the quarries. The volumetric measurements were carried out based on the DTM (Digital Terrain Models) tin surface extracted from laser scans and reference plane.

Another important objective of the project is to develop an extensive database of petrographic and geochemical characteristics of white and grey crystalline marbles. This database is a GIS-based Internet application accessible to all scholars.<sup>2</sup> A large number of samples collected in the quarries have already been subjected to microscopic examination of thin sections, XRD, carbon and oxygen isotopes, as well as strontium isotopes analysis, etc. The exact location of the samples within the quarry was documented by means of a total station, GPS receiver, and the 3-D laser scanner.

The fieldwork conducted as part of the *Marmora Asiatica* project has added significantly to previous studies.<sup>3</sup> At present, over 50 new individual quarries have been identified. Their discovery demonstrates the viability of using extensive survey as a method for locating new quarries and underscores the general fact that not all ancient quarries have been discovered or documented. This has important implications for existing scientific databases used to determine the provenance of artefacts. For archaeometric investigation, approximately 1200 samples were taken from the quarries. Preliminary results of petrographic and geochemical analyses from our study add a significant amount of new data. It is likely that other sources of white and coloured marble remain undetected. In addition to the scientific results, maps, 3-D models of individual quarries, are available in our database. Together they should serve to answer broader questions about the nature and scale of the marble quarrying industry in Asia Minor and across the Roman Empire. The importance of our survey and of geological and archaeological documentation, especially 3-D scanning, is all the more crucial since much of the evidence for ancient quarries has been lost as a result of extremely intensive modern exploitation.

### Notes

<sup>1</sup> For example: Attanasio et al. 2008; Attanasio et al. 2009; Long 2012.

<sup>2</sup> <[www.marmoraasiatica.uw.edu.pl](http://www.marmoraasiatica.uw.edu.pl)> (14. 12. 2021).

<sup>3</sup> See, e.g., Wielgosz-Rondolino et al. 2020.

### References

#### **Attanasio et al. 2008**

D. Attanasio – M. Brilli – M. Bruno, The Properties and Identification of Marble from Proconnesos (Marmara island, Turkey): a New Database Including Isotopic, EPR and Petrographic Data, *Archaeometry* 50, 2008, 747–774.

#### **Attanasio et al. 2009**

D. Attanasio – M. Bruno – A. B. Yavuz, Quarries in the Region of Aphrodisias: the Black and White Marbles of Göktepe (Muğla), *JRA* 22, 2009, 313–348.

#### **Long 2012**

L. Long, Regional Marble Quarries, in: C. Ratté – P. De Staebler (eds.), *The Aphrodisias Regional Survey, Aphrodisias 5* (Mainz 2012) 164–201.

#### **Wielgosz-Rondolino et al. 2020**

D. Wielgosz-Rondolino, F. Antonelli, M. Bojanowski, M. Gładki, M. C. Göncüoğlu, L. Lazzarini, Improved methodology for identification of Göktepe white marble and the understanding of its use: A comparison with Carrara marble, *JASc* 113, 2020, 1–20.