

“MARMORA” PROJECT: CHARACTERISATION AND PROVENANCE ON HISTORICAL MARBLES IN THE APULIA ARTISTIC AND ARCHAEOLOGICAL SITES (SOUTHERN ITALY)

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Abstract – MARMORA is a research project designed by PugliaMia, Association for study, conservation and valorisation of Cultural Heritage of Apulia (southern Italy). The main topic of the project is the characterization and provenance of historical stone materials, in particular Roman marbles, employed and after reused in subsequent periods, in artistic, archaeological and architectural heritage of the region. The project aims to improve the scientific knowledge of these historical evidences and to guarantee their better conservation, valorisation and enjoyment. In cooperation with the Post Graduate School for Cultural Heritage and Landscape of the Polytechnic of Bari and with the Geoenvironmental and Earth Science Department of the University of Bari Aldo Moro, detailed studies about mosaics of St. Nicola’s Basilica and marble altars in the churches of the historical centre of Bari have already begun. The phases include 3-dimensional representation of artwork thanks to a photogrammetric acquisition, characterisation of materials, mainly in comparison with the most famous and complete catalogues of collections of ancient stones and marbles, and restoring and conservation suggestions. Preliminary results suggested the use and reuse of rare and meaningful marbles in the considered sites, highlighting their significant relationship with the local history. The adopted multi-disciplinary approach had proved to be a powerful way to study of marble artworks, which allowed to lay the groundwork for the future MARMORA focusses.

Key Words – ancient stone, Apulia, archaeometry, 3D survey

I. INTRODUCTION

Characterisation and provenance of ancient marbles represent an interesting research field which was

considerably addressed by the international scientific community, in order to define human, cultural, religious and economic relationship between both Roman provinces and European Medieval cities. The interest of the research for the ancient marbles topic is based on their powerful and deep symbolic meaning, as well as a connotation of beauty, prosperity and political prestige [1,2]. In the Roman age, mainly in the I-III century AD, good-looking and rare rock materials were extracted from quarries of the empire and imported to Rome and in the main Roman provinces, to be used as decorative marbles in public buildings (thermae, temples) or private commissions (sarcophagi, tubs) [3]. In the Medieval period and after, during the Baroque season, marble *spolia* of destroyed or abandoned site were re-employed with decorative purpose in Christian buildings [4]. In Italy, the Cosmatesque floor [5,6] of the Roman Basilicas, the columns of the façade and the mosaics of St. Marco’s Basilica in Venice [7] and of the Palermo cathedral, the pulpit of Salerno and Siena churches, are just few examples of use and reuse of white and coloured marbles. In Apulia, region in the South part of Italy, noteworthy is the use of precious marbles in the Roman age and the reuse of ancient *spolia* in the Medieval period [8]. A mention is due to the mosaics of St. Nicola’s Basilica and St. Sabino’s cathedral, both in Bari, the column of the Canosa cathedral, the church of St. Giovanni *al sepolcro* in Brindisi and in the Troia and Lucera churches, and in the Baroque altars of Altamura and Gravina cathedrals [9,10, 11]. MARMORA is a research project designed by researchers and specialists of PugliaMia Association and focusses on the recognition, the study of lithology and provenance and the conservation and valorisation of marble artworks placed in churches and other religious

buildings of Apulia
(http://pugliamia.org/?page_id=522).



Figure 1. Altar in the Altamura cathedral [10]

The purposes of the project are to assess a contribution to the international researches about the use in the Roman age and the reuse in Medieval and Baroque period of white and coloured marbles coming from the Mediterranean and European quarries, in particular in terms of reconstruction of human, economic and cultural route of the Apulia and in order to discover the employment of precious marble in the regional evidences. Moreover, MARMORA aims to valorise the Apulia Cultural Heritage, through conservation and enjoyment improving proposals. Thanks to the partnership with the Post Graduate School for Cultural Heritage and Landscape of the Polytechnic of Bari and of the Geoenvironmental and Earth Science Department of the University of Bari Aldo Moro, a team of experts and specialists, including researchers, art conservators, architects, archaeologists, restorers was founded. They were grouped into different research teams and each of them dealt specific research focus and were guided by a Scientific Committee.

Other side activities were carried out, namely cultural tour to discover the story and the use of Roman marbles in the ancient city of Bari.

II. MATERIALS AND METHODS



Figure 2. Photographic acquisition of mosaics in the crypt of the St. Nicola's Basilica in Bari

The MARMORA project principally included three research phases: 1. Photographic acquisition and photogrammetric restitution, using professional camera, equipped with tripod, and adopting a suitable software for the image analysis (Fig. 3); 2. Identification of ancient marbles and local stones, in terms of lithology, commercial variety and provenance, through comparison with renown provenance materials and using catalogues of the most famous marble and stone collection of the world [9]; 3. Analysis of deterioration processes and conservation conditions in order to suggest restoring action which can be carried out in collaboration with the researchers and students of the Master degree in "Conservation and Restoration of Cultural Heritage (LMR 02)" of the Geoenvironmental and Earth Science Department of the University of Bari Aldo Moro.

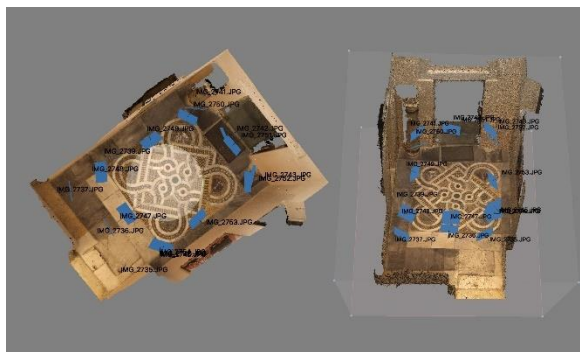


Figure 3. Software elaboration of 3D model of a portion of mosaic in the crypt of St. Nicola's Basilica in Bari

III. RESULTS AND DISCUSSION

In the city of Bari, starting point of the MARMORA project, some examples of use and reuse of ancient marbles have been identified, sometimes coupled with local imitation or restoration marbles. Among these sites, very noteworthy were mosaics of St. Nicola's Basilica, placed in the apsidal floors of the upper church and of the crypt. In both cases they looked very articulate and rich in coloured marble varieties, and resumed the famous Cosmatesque style floors of Roma churches. Nevertheless, the enjoyment is denied because they are sometimes inaccessible and partially covered by the Saint tomb or altar and religious ornaments, such as chairs and statues (Fig. 4).



Figure 4. Mosaics of the apsidal floor of the St. Nicola's Basilica in Bari

Further important evidences of marble uses were found in the baroque altars in some churches of Bari and of the neighbours. For example, in the crypt of the Cathedral and in the St. Giacomo's church (Fig. 5), articulate composition of ancient marble and

modern stones in typical geometry was observed. Other examples of marble altars are preserved in the churches of Polignano a mare, Gravina di Puglia, Canosa, Altamura, Andria, Foggia, Lecce, Taranto and several cities of Apulia.



Figure 5. Coloured marble altar of the St. Giacomo church in Bari (XVIII century)

IV. CONCLUSION

MARMORA is a challenging project which counts on the cooperation and the synergy between young researchers and experts with different and specific skills and adopts a multi-analytical approach founded both to precise and low-cost technologies for the image acquisitions and to experience of involved scholars, to enhance the enjoyment and valorise the Cultural Heritage of the Apulia.

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REFERENCES

1. Lazzarini, L. (2004). *Pietre e marmi antichi. Natura, caratterizzazione, origine, storia d'uso, diffusione, collezionismo.* Padova: CEDAM.

2. Lazzarini, L. (2004). Archaeometric aspects of white and coloured marbles used in antiquity: the state of the art. *Per. Mineral.* 73: 113-125
3. De Nuccio, M., Ungaro, L. (2002). *I marmi colorati della Roma imperiale.* Venezia: Marsilio.
4. De Lachenal, L. (1995). *Spolia. Uso e reimpiego dell'antico dal III al XIV secolo.* Milano: Longanesi.
5. Creti, L. (2002). *I Cosmati a Roma e nel Lazio.* Roma: Edilazio.
6. Del Bufalo, D. (2012). I marmi antichi nel riuso cosmatesco. In Creti, L., *La cattedrale cosmatesca di Civita Castellana, Atti del convegno internazionale di studi Civita Castellana, 18-19 settembre 2010.* Roma: «L'ERMA» di BRETSCHNEIDER, pp. 167-184.
7. Lazzarini, L. (2012). I marmi e le pietre del pavimento marciano. In Vio, E., *Il manto di pietra della Basilica di San Marco a Venezia. Storia, restauri, geometrie del pavimento* (pp 51-107). Venezia: Cicero editore.
8. Conte, R., D'Elia, A., Delluniversità, E., Fioretti, G., Florio, E. & Navarra, C. (2015). Stones and Ancient Marbles of the 'Francesco Belli' Collection: Archaeological, Art-Historical, Antiquarian, Geological-Technical and Petrographical aspects. In Pensabene, P. & Gasparini, E., *Interdisciplinary Studies on Ancient Stone ASMOSIA X Proceedings of the Tenth International Conference of ASMOSIA Association for the Study of Marble & Other Stones in Antiquity Rome, 21-26 May 2012.* Roma: «L'ERMA» di BRETSCHNEIDER, pp. 485-502.
9. Belli D'Elia, P. (2003). *Patrimonio artistico italiano. Puglia romanica.* Milano: Jaka Book.
10. Acquafredda, P. (2015). *Marmi policromi nella cattedrale di Altamura: aspetti petroarcheometrici.* *Geologi e Territorio XII-1:* 3-14.
11. Pasculli Ferrara, M. (2013). *L' arte dei marmorari in Italia meridionale. Tipologie e tecniche in età barocca.* Roma: De Luca Editori d'Arte.