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The marble of the David of Michelangelo: a multi-method analysis of provenance

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Abstract

The origin of the marble block utilised by Michelangelo for sculpting the David has been determined with the aid of a multi-method provenancing procedure including spectroscopic (EPR), isotopic and other miscellaneous variables. Data processing was carried out using discriminant function analysis. The provenancing procedure was split into three sequential steps aimed at obtaining increasing spatial resolution. High values of relevant probabilistic parameters indicate that the David's marble originates from Carrara and, specifically, from the Fantiscritti quarries (Miseglia), thus confirming the assignment proposed in the 19th century on the basis of simple autoptic examination. The role of different provenancing techniques in the three stages of the analysis is briefly discussed, as is the performance of instrumental methods as compared with the ability of a trained human eye.

Keywords: David; Michelangelo; Carrara; Fantiscritti; Marble provenance; Isotopes; EPR

1. Introduction

The vicissitudes of the marble utilised by Michelangelo between 1501 and 1504 for sculpting the David (Fig. 1) are known to us from the documents of the Opera del Duomo (see for instance [23]) and have been told in detail by his contemporaries [6,25] and, later, by many others [13,21,26].

The enormous marble block, more than 5 m long, was quarried at Carrara almost 40 years before with plans to be used by Agostino di Duccio who, in 1464, signed a contract with the Opera for a giant statue of a Prophet to be placed on one of the buttresses of the tribunes of the cathedral of Florence. Two years later, however, the project was abandoned, apparently because Agostino or his assistant Bartolomeo di Pietro had spoiled the marble by blocking it out badly or, more probably, because Agostino, who had no necessary experience with large statuary work, felt himself unfit for such a demanding project.

In 1476, after the outlined block had lain idle for about 10 years, Antonio Rossellino next took up the work only to abandon it after a few months. Later, in 1501, about the same time that Andrea Sansovino demanded the apparently worthless piece of marble as a gift, Michelangelo promised to carve a statue from the block without cutting it down or adding spurious pieces of marble. The contract with Michelangelo was signed in 1501 and "on September 13, a Monday, very early in the morning he began to work on the block firmly and bravely" ([26], vol. I, p. 80). The David, completed in about three years, was placed in Piazza della Signoria in front of Palazzo Vecchio and unveiled on September 8, 1504.

Despite the wealth of information available concerning the sculpting process, no direct historical record

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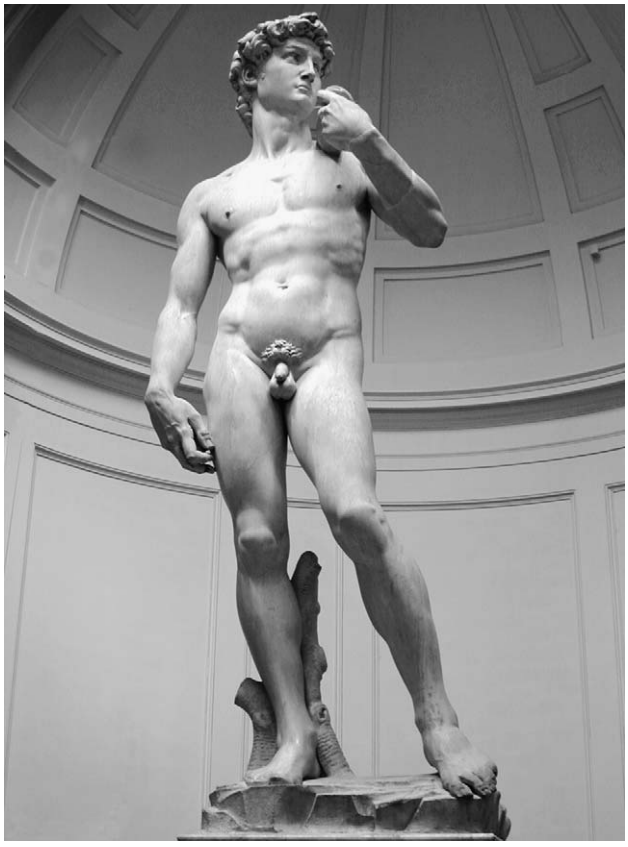

Fig. 1. The David of Michelangelo photographed before its recent restoration.

remains concerning where the block was quarried. It is generally believed that the block came from the Fantiscritti quarry which, together with Canalgrande, comprise the two historical extraction sites of Miseglia, one of the three main Carrara quarrying districts – the other two being Colonnata and Torano.

The Fantiscritti provenance is based on an examination carried out in 1866 by a technical committee, charged with the purpose of reporting on the state of conservation of the statue and of considering the feasibility of moving it to its present location in the Accademia di Belle Arti ([13], vol. II, pp. 45–48). At that time scientific studies of marble materials were still a dream of the future; the committee worked by carrying out, basically, a very accurate visual inspection of the artefact. Notwithstanding the limited methods of examination available to them, the committee's great experience and deep knowledge of Apuan marbles, make the Fantiscritti hypothesis an important and fairly credible starting point for further studies.

At the current time, several analytical techniques and statistical data classification methods are available with which to make a more conclusive determination of the David's origin. A reconsideration of the marble's provenance can provide not only information deemed essential for a deeper understanding of the artefact and its manufacturing process, but also a secure identification of the material that is necessary for any future planned conservation or restoration work.

The present study is based on the use of two different and complementary provenancing techniques: the determination of carbon and oxygen stable isotope ratios and EPR (electron paramagnetic resonance) spectroscopy. Isotopic analysis is certainly the best known and most widespread method for determining the origin of unknown marble samples. It is generally agreed, however, that single analytical techniques cannot satisfactorily solve problems of provenance [22,19]. The technique of EPR spectroscopy can provide indispensable supporting data. From the time that the two methods were first introduced [8,7], several databases of quarry samples have been developed [16,20,24,12], they have been used, sometimes in combination with other methods, as the primary techniques for assigning unknown samples. Unfortunately detailed quarry data are rarely published, simple summarizing graphs, which do not permit an accurate comparison with unknown sample data and make quantitative use of the methodologies difficult or impossible, are more typically substituted.

With the aim of overcoming these difficulties an entirely new marble database has been established and fully published in the last few years. The database, originally based on EPR spectroscopy alone, has been subsequently extended to additional petrographic and other miscellaneous variables [2] and is now being further augmented by the introduction of isotopic variables. The purpose is to provide the scientific community with a set of quarry data fully available and open to further expansion and improvement.

The method has been already tested in a number of applications. The analysis of the David's marble, made possible by the comprehensive project of investigation and restoration promoted by the Polo Museale Fiorentino and the Gallerie dell'Accademia for the fifth anniversary centennial of the David, represents, beside its intrinsic interest, another opportunity to verify the validity of the approach, particularly in the light of already existing information. A brief account of this work, limited to its main conclusions, has already been published elsewhere [4].

2. Material and methods

Three samples (F17G, F18G, and F19G), weighing on the whole about 120 mg, were available for the measurements. They all originate from the second toe of the left foot of the David, partly destroyed by an act of vandalism that occurred in 1991, and for this reason the three specimens are better described as parts of a single sample with identical physico-chemical properties.