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A remarkable celestial globe from the 18th century

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Abstract

Celestial globes are a clear manifestation of the connection between art and astronomy. After introducing the production and significance of globes across history, we focus on a unique celestial globe preserved at the Spanish National Library; its origin or manufacturer remain unknown. The set of constellations that it includes, its execution, and the piece of furniture that supports it suggest that it dates back to the late 18th century. The globe has exceptional characteristics, such as the dark blue background and golden colour, which break with previous tradition; the lack of any annotations indicating the manufacturer or the characteristics of the globe is also something extraordinary. We have found a connection with a celestial globe currently held at Museo de América, in Madrid, produced by Dudley Adams in London at the end of the 18th century. Due to the dating and its radically innovative characteristics, we also propose the hypothesis that the globe from the Spanish National Library may have been manufactured in the instrument workshop of the Royal Observatory of Madrid around 1795, by instrument makers trained in London. If this is the case, it could be the celestial globe that was given to King Charles IV and which was considered lost until today. This study is the result of a collaboration between an astronomer, an art historian, and two curators from the National Library of Spain.

1 Introduction: production and significance of globes

Terrestrial and celestial globes are a prime example of the connection between art and astronomy. One of the oldest celestial globes is the astounding "Atlas Farnese" sculpture, currently on display at the National Archaeological Museum of Naples. It displays the titan Atlas, who was condemned to supporting the whole celestial sphere as a punishment for his role in the fight against the Olympic gods. On the marble sphere we find beautifully delineated constellations, many of which were compiled in Antiquity and are still in use nowadays.

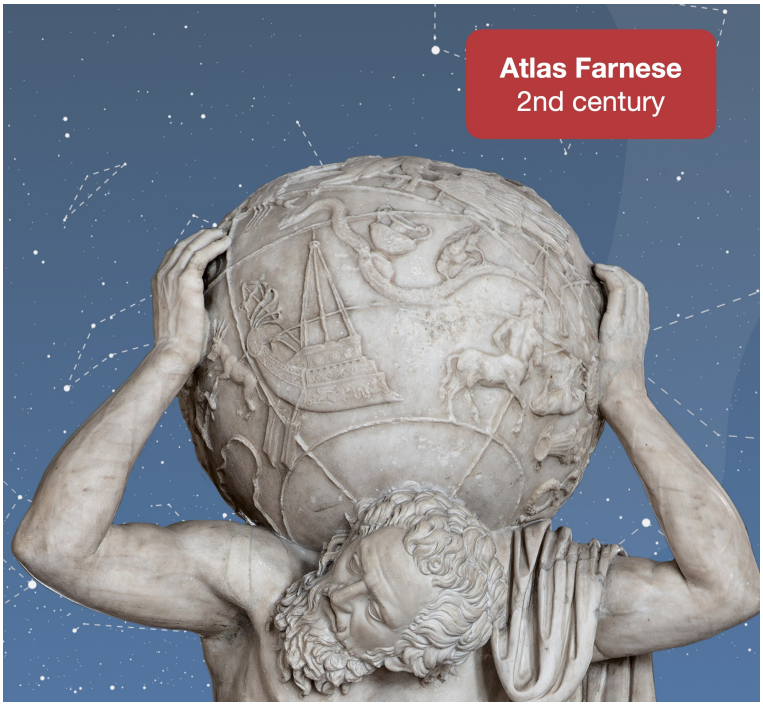

Figure 1: Atlas Farnese, marbel sculpture showcasing one of the earliest representations of a celestial globe that we preserve (National Archaeological Museum, Naples).

In the Middle Ages, we encounter an explosion of celestial globes carved on bronze spheres, mostly associated with the Arab world. In fact, some of the oldest extant copies were produced in the Iberian peninsula, back then part of al-Andalus. Some of them reflect the arabisation of the classical constellations carried out by al-Sufi.

The Renaissance led to a renewed interest in both celestial and terrestrial globes, with prime examples such as Martin Behaim's "Erdapfel", the oldest terrestrial globe from the western world. Rafael's beautiful allegoric painting of Urania, the muse of astronomy, displays her gracefully setting a translucent celestial globe in motion.

In the 17th century, especially in the Netherlands, globes began to be produced *en masse* thanks to the development of new techniques. As opposed to manuscript globes, which had to be drawn (or carved) individually, the 17th century witnessed a boost in the production of printed globes (usually based on copper engraving); the globes were printed on a set of elongated gores that would then be glued on top of a sphere of stucco. This is the kind of globe that producers such as Hondius, Blaeu, or Valk would manufacture, and which appear in paintings such as Vermeer's famous "Astronomer" (Louvre Museum). Many of these manufacturers established family businesses that would be carried over in time.

For around three centuries starting around 1600, globes were typically produced in pairs: a celestial globe accompanying a terrestrial globe, both of equal diameter, intended to be displayed side by side. This way, globes represented the ultimate synthesis of cosmography,

the union of cartography and astronomy. As such, they were symbols of knowledge and social status, on top of being actual scientific instruments. Indeed, a celestial globe allowed to calculate, for example, the time of sunrise, sunset, or twilight for a given latitude on a certain day of the year.

This work deals with an outstanding celestial globe held at the Spanish National Library, presumably from the 18th century, and which remains highly mysterious. As a side product, this project has triggered the compilation of the first catalogue of old globes, armillary spheres, and planetaria in Spain, as we will comment below.

2 The celestial globe of Godoy

Figure 2: Detail of the celestial "globe of Godoy" (National Library of Spain).

The Spanish National Library preserves a truly exceptional celestial globe, the so-called "globe of Godoy". Manuel Godoy was the Spanish prime minister under King Charles IV, at the end of the 18th century and very beginning of the 19th century. When the Napoleonic War started in 1808, both Charles IV and Godoy had to flee Spain, and the belongings of the prime minister were largely expoliated. Part of his library, presumably including this remarkable celestial globe, passed over to the National Library, where it has been until today.

This celestial globe is a true mystery: the manufacturer, production date and even country of origin remain unknown. The furniture and style suggest that it dates back to the 18th century, and this is the way it is listed in the catalogue of the National Library [1]. However, the dark blue background departs from the 18th century tradition of printed globes, which typically have light backgrounds. We find exceptional examples of blue globes which often constituted presents for kings or highly distinguished people, such as the famous pair of globes produced by Vincenzo Coronelli for King Louis XIV (1683, Bibliothèque national de France), the beautiful celestial globe by Arboreus (1575) preserved at the Bayerische Staatsbibliothek in Munich, or the pair of globes by Marcator which were presumably a present for the Spanish emperor Charles V (today at the Globe Museum in Vienna).

The dark blue sphere has a diameter of 68 cm, surrounded by a metallic meridian ring and laying on a piece of wooden furniture. The magnificent drawings that depict the constellations

are inspired by the celestial atlas of Hevelius and are golden in colour, which contributes to the exceptional nature of this globe. Even though a quick look conveys the impression that the globe lacks any annotations, this is not true, and the names of the constellations (in Latin) and months are indicated in relief, in the same blue colour as the background. The stars are marked with metallic cutouts (golden or orange) which are glued on top of the sphere; the size and number of points in the stars vary, roughly correlating with the apparent magnitude of the stars.

3 Hypotheses of origin and Dudley Adams

Figure 3: The celestial "globe of Godoy" (National Library of Spain) next to a celestial globe by Dudley Adams (Museo de América, Madrid). Both spheres have exactly the same diameter (68 cm).

This project has revealed a very suggestive connection with a pair of globes by Dudley Adams at the Museo de América in Madrid. They have exactly the same diameter and a nearly identical supporting piece of furniture. The internal records from the Museo de América show that this pair of globes comes from the Spanish National Library (on permanent loan since the foundation of the Museo de América).

The remarkable similarities between the globe of Dudley Adams and the "globe of Godoy" in terms of size and supporting structure (as well as the design of the constellation drawings) suggest that there might be a close connection between them. One option is that the "globe of Godoy" was also produced by Dudley Adams. However, to our knowledge, no other blue globes by Dudley Adams are preserved anywhere else in the world and, furthermore, it seems

Figure 4: Comparison of a Gregorian telescope by Dudley Adams and one by Carlos Rodríguez and Mario Fernández, who would found a workshop of instruments at the Royal Observatory of Madrid, produced during their training period in London. The similarity is remarkable.

unlikely that a professional manufacturer of globes such as Adams would not sign such a globe. Indeed, at the 18th century it was customary to add a cartouche indicating the name and address of the producer of the globe, often also the year, and Dudley Adams followed this tradition closely.

Another hypothesis that we propose here is that the globe may have been produced at the Royal Observatory of Madrid, in the newly established workshop of instruments, in the decade of 1790. Carlos Rodríguez and Mario Fernández, two young Spanish astronomers, were actively trained in London around 1790 in the art of producing astronomical instruments; we do not know with whom they learned, but the contact with Dudley Adams seems highly likely given the coincidence in time and space. The similarity between a telescope that Carlos Rodríguez and Mario Fernández manufactured and signed (in 1790), and a very similar telescope from Dudley Adams, also supports the idea that there was a probable connection between them. If the blue celestial globe was produced at the Royal Observatory of Madrid, this would match the statement from Gil de Zárate (from the mid-19th century) that, by 1795, the director of the Royal Observatory of Madrid gave two globes as presents to the king, Charles IV [2]. If the king received such a blue celestial globe, it seems very likely that it was passed over to Manuel Godoy, who was passionate about scientific instruments and called himself "protector of the Observatory" according to his own memoirs. In any case, it is also possible that the globe could have been repainted in blue at some point on top of an original globe by Dudley Adams.

4 A catalogue of old globes in Spain

Catalogues of old globes exist for most European countries. However, so far even a preliminary catalogue of old globes preserved in Spain is totally lacking. As a side product of this project on the celestial globe of Godoy, Miguel Querejeta has started compiling a catalogue of globes in Spanish public collections, which will be subsequently extended to private collections and religious institutions.

This catalogue has already identified more than 200 spheres older than 1900 currently preserved in Spanish public collections. This includes celestial globes, terrestrial globes, armillary spheres, and planetaria. These are mostly of English or French origin, very often from the late 18th century or early-mid 19th century. There are few Spanish producers among the globes that have been catalogued so far; the few exceptions include Tomás López, Antoni Monfort, Faustino Paluzíe, and Benjamín Tena. We kindly asked the audience to get in contact with us (m.querejeta@oan.es) if they are aware of any globes, particularly those in private collections, which may have escaped our attention.

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