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Comets in the Late Medieval sky $(13^{th}-15^{th}$ centuries)

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Abstract

The representation of comets throughout the Middle Ages offers an interesting case of study of how science and art are intertwined. Our research focuses on visual depictions of comets from the 13th to 15th centuries, emphasizing the interplay between direct observation and the transmission of classical knowledge. Here we present an overview of the ideological transformation that accompanied and justified the changes in the visual codification of comets in the Late Medieval Period.

1 Introduction

In line with the ideas behind the recently created Astronomy and Culture Commission, the study of cometary representations throughout the Middle Ages shows how the evolution of astronomical notions had its reflection in cultural manifestations and, likewise, how cultural conceptions conditioned astronomical development. Comets were studied according to natural philosophy, but also were used to make astrological prognostications that usually alluded to the political and religious problems of the time and permeated into literature and art. Here we present a layout of the basic ideas of the PhD project that we are currently working on, which consists of the analysis and contextualization of visual renderings of comets produced during the medieval times until 1577, the year in which the passing of a great comet, studied among many others by Tycho Brahe (1546-1601), opened the door for a key cosmological change [2]. We focus on how cometary iconography changed as the theories that explained them evolved.

In recent years, different studies have analyzed the cultural impact of comets, but not many of them have focused on the medieval period. This scarcity is more evident with regard to their visual codification. The systematic survey on medieval cometary representations that we are carrying out focuses on the Late Medieval Ages (13th-15th centuries), not only because the relative lack of previous studies, but also because we can trace back to that period the first systematic cometary observations as well as the establishment of a well-defined iconography, which finds its best expression in scientific manuscripts and illuminated historical chronicles. We are analyzing images produced in the Latin West, but also paying attention to the Islamic milieu as a vehicle for knowledge transmission [3]. We shall see that Late Medieval cometary iconography was the result of both direct observations of the night sky and the textual and visual transmission of the previous tradition.

2 Images of comets in the textual and visual tradition.

Around the second half of the 12th century, ancient Greek astronomical texts that had been preserved in Arabic in the Muslim world began to be translated into Latin, allowing western scholars to discover the theories they conveyed. The reading and interpretation of Aristotle's (c.384-c.322 B.C.) theory of exhalations, present in his *Meteorologica*, was essential for the medieval cometary theory. Its main idea was that comets were not celestial bodies but meteorological phenomena that occurred in the atmosphere. A phenomenon that appeared and disappeared in an unpredictable way in the sky could not fit in the Aristotelian model of the universe, in which everything happening above the moon was in the realm of perfection and eternity. According to Aristotle, comets were large masses of hot and dry exhalations that came out of the earth and burned in the upper layers of the atmosphere when they reached the layer of fire, thus explaining their random appearance [1].

Even if Aristotle only associated them to strong winds and drought, from very early on they were linked to catastrophic events such as plagues, earthquakes and political turbulence. Moreover, texts attributed to Ptolemy (c.100-170) that also became available to western scholars in the second half of the 12th century, the *Tetrabiblos* and the *Centiloquium*, allowed an astrological interpretation of comets, assigning a particular meaning to them depending on their colour, position, duration and closer planet [12]. Starting from here, western scholars such as Robert Bacon (c.1219-c.1292), Robert Grosseteste (c.1170-1253) or Aegidius of Lessines (c.1230-c.1304) wrote their own treatises on comets, which were either commentaries on previous texts or treatises written after the sudden appearance of a comet [15].

2.1 Comet images in scientific contexts: astronomical, astrological and encyclopedic treatises

Accordingly, the most frequent way in which we find comet representations is as an isolated image of a strange-looking star in the folia of a manuscript containing a scientific treatise. In these cases, the image accompanies a text describing the nature of comets and serves as a visual aid for the reader or student to understand the described phenomenon. It is also possible to find an astronomer pointing toward the sky where a comet floats, as occurs in James le Palmer's *Omne bonum* (London, British Library, Ms. Royal 6 E VI, f.340v, c.1360-75), an encyclopedic work in which the letter C for *Cometa* is inhabited by a man pointing to a big gold and reddish star [16]. This also happens, for example, in manuscripts

containing the Aristotelian corpus that were made for university students. In one of them (British Library, Ms. Harley 3487, f.140v, 13th century), Aristotle himself points to several phenomena taking place in the atmosphere.

More rarely, in broader diagrams that intend to depict the spheres of the universe, we may glimpse a small comet below the moon, between the layers of air and fire, as occurs in 15th century astronomical compilation (Philadelphia, Pennsylvania University Library, Ms. LJS 226, f. 6r). A curious example of how this scientific display of information permeated in other cultural contexts appears in the *Songe de pestilence*, a French allegorical poem written in 1379 which narrates in a prophetic tone the disgraces preceding the great bubonic plague of 1348, among which were an eclipse, a triple planetary conjunction, and a comet [14]. In a diagram that accompanies most of the manuscript copies containing this poem, all three events are depicted carelessly inside the concentric circles of the universe, the comet traveling through the sphere of Mars (e.g. Paris, Bibliothèque national de France, Ms. Français 12399, f. 169r, last quarter of the 14th century). We should not see this as a precocious statement of comets being celestial bodies, but as misuse in a literary context of a scientific image for a rhetorical purpose.

But the text that shaped cometary iconography the most in the Late Middle Ages was a short treatise called *De cometis*, wrongly ascribed to Ptolemy both in its Latin and Arabic version. It gives a list of comet names, a feature that can be found in previous works from Antiquity, namely, Pliny's (c.24-79) Naturalis Historia. De cometis distinguishes nine types and gives each of them a name and a brief description of their shape, color, planet to which they are linked, and the effects they produce [6]. However, most of its copies produced in the 13th and 14th centuries do not have images of this cometary typology. They do appear in later vernacular works of the 15th century which incorporate De cometis as one of their chapters, as is the case of copies of Ludovicus de Angulos' De figura seu imagine mundi from 1456 (e.g. Madrid, Biblioteca Nacional de España, Ms. 9267, ff. 126v-128r) [4]. These nine comets could be of many colors (bright red, black, gold, silver, white, dark blue) and shapes (horns, swords, spears, tongs, circles, roses...) which prompted the artists' imagination to create an original cometary iconography. In certain occasions, they can attain an argumentative function, trying to convince the viewer of the dire consequences of its appearance. Astronomers also made use of this, and it was relatively common to classify a comet they just saw according to this list [6].

2.2 Cometary images in historical chronicles

Cometary iconography's influence goes beyond the limits of astronomical and astrological treatises and permeates another genre in which it is not strange to find mentions of comets: illuminated historical chronicles. In them we can find representations of comets seen at a time contemporary with the writing of the work, such as the one seen from Naples in 1491 and associated with the death of Peter of Aragon (New York, Pierpont Morgan Library, Ms. 801, f.99r), representations of comets of a legendary nature, such as the one that was said to have announced the reign of Uther Pendragon, father of King Arthur (Paris, Bibliothèque nationale de France, Ms. Français 74, f. 115v), as well as images of comets in which the



historical account and the legend are mixed.



Figure 1: The Massacre of the Romans of Asia Minor, *Romuleon*. Paris, Bibliothèque nationale de France, Ms. Français 364, f.262r, c. 1485-1490.

To illustrate this last point, we will discuss a particularly telling image (Fig. 1) present in a copy of the *Romuleon* by Benvenuto Rambaldi da Imola (c.1338-1390) made in Bourges c.1485-1490. It was offered to king Louis XII (r.1498-1515) by admiral Louis Malet de Graville (1438-1516) [7]. The image shows an event of the year 88 B.C. in which the king Mithridates VI Eupator (c.135-63 B.C.), ruler of the Kingdom of Pontus, ordered the killing of all the Romans living in the cities of west Anatolia to stop the spread of the Roman Republic's influence in the territory. In a lavishly illuminated folio, we see the massacre taking place in what looks like a European Late Medieval city. At the top left corner, moving across the rooftops of various gothic buildings, a bright, gold comet is seen, composed of a coma and a long and shiny tail. We could interpret this as a reminder of a comet that appeared around the time of the massacre and that could have been interpreted as a herald of the upcoming war. However, the identification of this comet presents several difficulties. The figure of the Persian-Greek king Mithridates, who is portrayed in several Latin sources as the epitome of the evil ruler, is strongly linked to comets. According to a passage preserved in the *Epitomae* of Justinus (2nd century A.D.), his future greatness was foretold by a comet that blazed for seventy successive days, both the year in which he was born (c.135 B.C.) and in that in which he began to reign (c.119 B.C.) [8]. This story became well-known in the Late Middle Ages after it was included in Giovanni Bocaccio's *De casibus virorum illustrium* (*On the Fates of Famous Men*, c. 1355-1360), which was probably a source for the *Romuleon* [5]. Moreover, the comet in this illumination could also be Halley's comet in its passing of 87 B.C., only one year after these events, but it is not probable since the sources that mentioned it do not link it to the figure of Mithridates [13]. Hence, this image shows how a possibly real historical pair of comets from Antiquity are reinterpreted in an illuminated manuscript, which is part of a broader symbolic program that tried to connect the late 15th century French royal court with the events of the Roman past.

3 The role of direct observation in cometary iconography

Comet records became progressively more precise during the Late Middle Ages. It would not be until the late 15th century that we can talk of proper systematic cometary observations, but we do detect some attempts in the previous centuries of carrying out detailed observations and a certain interest in extracting knowledge from the act of watching, in line with the Aristotelian thought. Surely, the possibility of casting astrological judgments out of comets, increased the interest to watch them more carefully, as can be seen in several treatises written after the comet of 1264 [15]. We could understand Giotto's (c.1267-1337) alleged depiction of comet Halley of 1301 in the Scrovegni Chappel in Padova, executed in a more naturalistic approach, as a result of direct observation [11], but this does not mean that the comet has been detached from its symbolic meaning.

It is important to state that the circulation of the nine-type cometary iconography and the depiction of marvelous comets in historical chronicles was happening at the same time as the first systematic cometary observations that collected quantitative data were taking place, such as the ones carried out by Paolo dal Pozzo Toscanelli (1397-1482), Georg von Peuerbach (1423-1461) or Johannes Regiomontanus (1436-1476). Specially, the comets of 1456 and 1472 generated a great number of treatises across Europe, often linked to political interpretations [10]. Direct representation of the observed phenomena, however, is very rare and limited to non-sumptuary works, as happens in Jaume Safont's (c.1420-1487) observations of comet Halley of 1456 from his rooftop in Barcelona, recorded in the *Dietaris* of the Generalitat de Catalunya, accompanied by a small depiction of the comet [9]. A unique example is present in the famous manuscript that gathers Toscanelli's observations of five different comets (Florence, Biblioteca Nacionale Centrale di Firenze, Ms. Banco Rari 30). In one of them (f.250A), the comet of 1449-50 is no longer a terrible star, but a series of dots with a tail that move across the constellation of Serpentario.

There still was a long way to go until the arrival of the comet of 1577, whose observation led to the idea that comets were indeed happening way beyond the Moon and that change was possible in the spheres of the universe [2]. Its revolutionary consequences should be understood considering that, before it, observational data kept being gathered by astronomers in the Late Medieval period and early 16th century. Although it can be said that observation gradually gained the upper hand over textual tradition, Aristotelian theory and Ptolemaic terminology of comets survived for a long time in cultural productions (literature, music, calendars, astrological pamphlets...), long after the passage of the comet of 1577.

4 Summary

In a process that combined transmission of textual traditions and direct observation of the night sky, a rich cometary iconography emerged in the Late Middle Ages. These images usually depended on Ptolemaic texts but on many occasions proved to be very imaginative. They conveyed the information provided by the text, but also served as support for the study and understanding of comets by the astronomer, helping with the identification of the perceived phenomena. In conclusion, comet representations are a prolific topic that, uniting art history and astronomy, constitute a clear example of how multiple social and cultural factors condition and contribute to the development of the ideas concerning our perception of the cosmos.

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