

Sometimes enjoying considerable favor, sometimes less, iconography has been an essential element in medieval art historical studies since the beginning of the discipline. Some of the greatest art historians – including Mâle, Warburg, Panofsky, Morey, and Schapiro – have devoted their lives to understanding and structuring what exactly the subject matter of a work of medieval art can tell. Over the last thirty or so years, scholarship has seen the meaning and methodologies of the term considerably broadened.

This companion provides a state-of-the-art assessment of the influence of the foremost iconographers, as well as the methodologies employed and themes that underpin the discipline. The first section focuses on influential thinkers in the field, while the second covers some of the best-known methodologies; the third, and largest section, looks at some of the major themes in medieval art. Taken together, the three sections include thirty-eight chapters, each of which deals with an individual topic. An introduction, historiographical evaluation, and bibliography accompany the individual essays. The authors are recognized experts in the field, and each essay includes original analyses and/or case studies which will hopefully open the field for future research.

Colum Hourihane received his PhD from the Courtauld Institute of Art, University of London, in 1983 for a thesis on the iconography of Gothic art in Ireland, part of which was subsequently published as *Gothic Art in Ireland 1169–1550: Enduring Vitality* (2003). He was deputy director of the Witt Computer Index in the Courtauld Institute until 1997 before becoming director of the Index of Christian Art, Princeton University, where he was until retirement in 2014. He has edited over twenty volumes of art historical studies and has single-authored five volumes. Among the latter are *The Processional Cross in Late Medieval England: The Dallye Cross* (2005) and *Pontius Pilate, Anti-Semitism, and the Passion in Medieval Art* (2009). A fellow of the Society of Antiquaries of London, he was elected an honorary fellow of the Royal Irish Academy in 2015.

VISUAL STUDIES

Cover image: Detail from the tympanum of the Saint-Jean (left) portal on the western facade of the Cathedral of Notre-Dame de l'Assumption, Rouen, showing Salome dancing before Herod. French, thirteenth century. Photograph: Colum Hourihane.

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23

PICTURING THE STARS – SCIENTIFIC ICONOGRAPHY IN THE MIDDLE AGES

Dieter Blume

Watching the stars was essential from mankind's earliest times. Observing the regular movement of the stars was the only way to facilitate a clear orientation in time and space. But to do that it, it was necessary to impose an order on the chaotic multitude of the stars. Constellations had to be defined and named. Groups of stars were represented as figures and there always was a relatively strong correspondence between the geometric patterns of the constellations and the appearance of these figures. Astronomy was therefore possible only when images were created and used. Even though astronomy is a very specific subject, it is also a characteristic case of scientific iconography and the following article will therefore concentrate on astronomical and astrological imagery.¹

Right up to the present, constellations are named after figures from Greek mythology. Before written records, the ancient Greeks defined the constellations and put the stars in a new order. Both Homer and Hesiod described these constellations.² The Greek system of ordering the stars has surprisingly never changed and the Latin names of these constellations are still used in modern astronomy. The early fathers of the Christian church polemicized against pagan astronomy and astrology. Hieronymus (c. 327–420) called the mythological tradition of the constellations a ridiculous and ugly slandering of the magnificent sky which had been created by God.³ Attempts to define a new Christian sky were never successful. Therefore, the church had to study what was considered a pagan astronomy for measuring time for the canonical hours during the night and even more importantly to calculate the exact date of the Easter calendar.

So the science of *computus*, which is concerned with the reckoning of time and the calculation of the calendar, was established in the early Middle Ages. The first handbook for this new science was written by the English monk Bede (672/73–735) in the monastery of Saint Paul's in modern Jarrow around 725 and has the title "De ratione temporum."⁴ Bede intentionally avoided giving any information on the single constellations or a precise description of the signs of the zodiac.

Later, the emperor Charlemagne (768–814) initiated a general reform of the calendar and a renewal of the sciences, especially of astronomy. Around 810, scholars at his court in Aachen created an extensive compendium, which collected all known cosmological information as well as that on the calculation of time. This work is known today under the title "The Seven-Book-Computus" or *Libri computi*.⁵ The fifth book discusses the planets and the stars and contains a catalogue of the single stars in every constellation, but gives no further information about the figures or their mythological background. It is likely that the Carolingian scholars planned their fundamental handbook without images. It was felt that the pagan figures that illustrated

the ancient manuscript they used should not be reproduced and neither should they be introduced into the education of the monks in the monasteries throughout the empire. At the start of medieval astronomy it is possible to detect a hesitation or maybe even a fear to accept the pagan names of the constellations as well as images of the mythological figures. In some of the earliest manuscripts, spaces into which images from the ancient models would be placed were left empty.⁶

This situation changed fundamentally under Charlemagne's son Louis the Pious (814–840). During his reign, classical manuscripts were produced in considerable numbers in Aachen and are characterized by an extensive use of antique models. Around 816, in a very ambitious collaboration between scholars and artists, a fine picture book of the constellations was produced.⁷ This codex is not a compilation of computistical and astronomical material, but is nothing else than the textual edition of an ancient poem, the Latin translation of the *Phainomena* of Aratos by Germanicus.⁸ This text is a tentative description of the starry sky, but offers no real astronomical information. Therefore detailed commentaries on that poem existed already in ancient times. This bundle of texts, the poem as well as the commentaries, which was also known as the tradition of Aratea, is the starting point for medieval astronomy. The manuscript for Louis the Pious, however, is a real picture book. The main focus is the collection of carefully painted images and there is a strong correspondence between text and images. Every constellation occupies a full-page miniature, which shows the mythological figure in an illusionistic manner, copying ancient painting in front of the blue sky. These images are not simply a copy of an ancient model, but represent instead a careful compilation of elements from different traditions and different models. A good example is the zodiac sign of Gemini (Fig. 23.1). The nakedness and the attribute of a



Figure 23.1 Gemini, Leiden, Bibliotheek der Rijksuniversiteit, Ms. Voss. Lat. Q 79, fol. 16v.

lyre are based on the Roman tradition of Germanicus illustrations, but the arming with lance and club as well as the presentation of separate figures who do not embrace goes back to the Greek tradition. The Carolingian painter added further details, such as the helmets crowned by a Christian cross. So the ancient twins – Castor and Pollux – appear as *miles christiani* or Christian warriors and this may well relate to the emperor Louis the Pious.

Near the end of the codex, next to a chapter discussing the zodiac in its entirety, as well as the planets and seasons, there is a specific combination of diagram and images, which is surprising. The basic structure corresponds to the diagram from the *Libri computi*, in that it shows the eccentric orbits of the planets around the earth. Venus and Mercury are shown with additional orbits around the sun. This theory is described by Martinus Capella and used to explain some of the irregularities in the orbits of these planets close to the earth.⁹ Detailed information, such as the time of their orbit and their specific positions on the zodiac, all coming from Pliny's *Natural History*, was written along the orbit lines of the single planets. This complex diagram was then replenished with carefully painted figures in medallions. There is an image of every planet and a personification of the earth is found in the middle. The signs of the zodiac and the labors of the months are shown in the outer circle. The iconography of all these images closely follows different ancient models. This full-page miniature is a sort of map of the universe, a model of the cosmos, which contains every piece of information that was available at this time. Furthermore, the position of the planets corresponds to their positions on April 16, 816!¹⁰ This was not an accidental date; it had the full moon just before Easter and was therefore a very important date for the calculation of the liturgical calendar. In addition, the sun is near to her *exaltatio* – that is, astrologically a very powerful position. Jupiter standing in Gemini may have been the zodiac sign of the emperor. Here, the Carolingian astronomers painted a remarkable and positive horoscope, which must surely have related to the reign of their emperor.

In the miniatures of the constellations, single stars are shown as golden rhombs in more or less the same positions they have in the figures. Astonishingly, it is possible to count more stars than in any other star catalogue of the early Middle Ages.¹¹ So, all the relevant astronomical information is shown in the images, and not in the text, but this information is available only for someone who has a basic knowledge of astronomy. This luxurious manuscript was probably created for the emperor and impressively documents the high level of astronomy practiced in Aachen at this time.

It also represents a sort of breakthrough for the images. After completing this famous codex, pictures of the constellations became an integral part of handbooks for computational matters and were copied for all the important monasteries in the empire. A manuscript of the *Libri computi* was produced around 820 in the scriptorium at Aachen and has colorful images of the constellations between sections in the text. Some traces of gold remain in the miniatures and indicate that golden stars were once found in front of the illusionistic figures.¹² Now, nearly every copy of the *Libri computi* has drawings accompanying the descriptions of the constellations. So the pagan imagery preserved in these pictures became an integral part of the scientific education of the monks.

With the adoption of these images, a new interest in the mythological legends associated with these figures arose; this was still lacking in the *Libri computi*. The earliest such work also comes from the court in Aachen. The sophisticated manuscript with impressive miniatures of the constellations was made there soon after 830, and also has a translation of Aratos by Cicero.¹³ The miniatures are made according to the ancient manner of a *carmen figuratum*. This means that the bodies of the figures were filled with text. As this text offers mythological explanations, both the myth and the image are presented in a sort of superimposition. Obviously myth and image are mutually dependent. These images opened the door for a new preoccupation with the pagan world of the mythologically defined constellations.

It is possible to describe three steps in the adoption process of pagan astronomy at the Carolingian court: first, there was the elaboration of a written star catalogue under Charlemagne (c. 810); second, there was the development of the images under Louis the Pious (c. 816); and last, there was a new reading of the ancient myths (c. 830). The images are an integral part of this intellectual process and inside the books they were used to transmit specific knowledge.

From the tenth century onwards it is possible to observe a shift in astronomical interests. There was no longer any focus on calendrical problems and instead there were cosmological questions. The description of the constellations with their image sequences was usually now part of the manuscripts that gathered basic material for the study of the *Quadrivium*, the mathematical sciences of arithmetic, geometry, music, and astronomy. The monastic scholars now looked for a logical understanding of the universe as a harmonic building that was created by God. The center for these advanced studies was the abbey of Fleury in Saint Benoît-sur-Loire in France. There was an immense library in this monastery with a considerable collection of all the basic ancient texts. An impressive number of astronomical manuscripts are also connected to this abbey. In the tenth and eleventh centuries, monks from all over Europe came to Fleury to improve their knowledge. At this time, the first texts to explain the Islamic invention of the astrolabium came from Fleury. Images of the constellations also attracted new attention, as documented by a series of framed and colorful miniatures in a codex dating from 940 to 950.¹⁴ These pictures show the figures in motion and integrate some elements from the mythological stories. For example, the painter has added a big snake under Andromeda's feet that refers to the sea monster in the myth, and this may also have been connected to Eve and the serpent from Paradise. With the help of Perseus, who of course could be a type of Christ, Andromeda resisted the sea monster and could be seen as a sort of counter image to Adam's sinful wife. A monk from Limoges who copied these images a little later strengthened these associations and showed Andromeda completely naked, which went against the ancient tradition (Fig. 23.2).¹⁵ The picture representing an

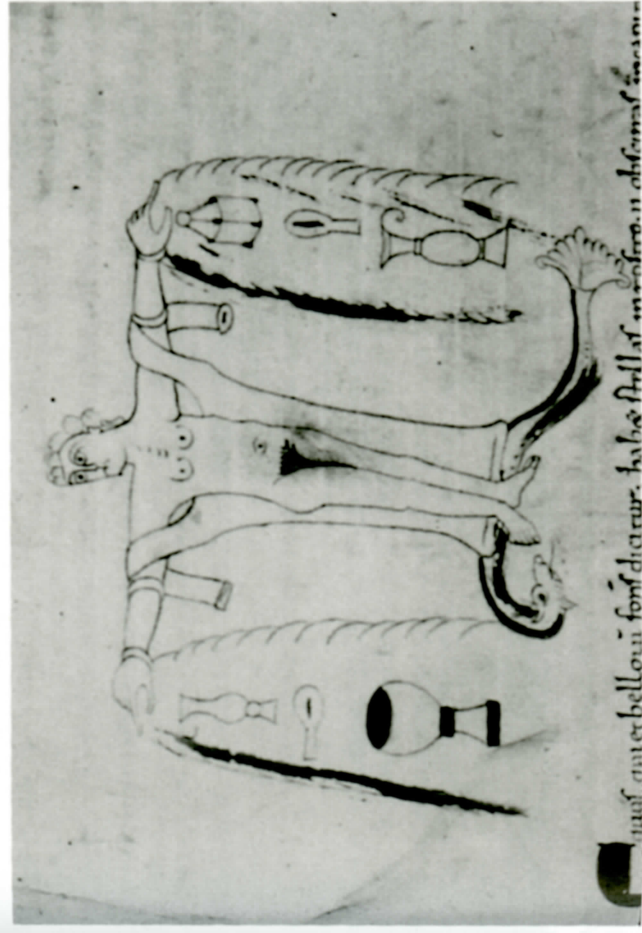


Figure 23.2 Andromeda, Paris, Bibliothèque Nationale, Ms. Lat. 5239, fol. 219v.

astronomical constellation had thus mutated into an image of female sexuality. Even if they are only simple drawings, it is clear that these illustrations could also stimulate different areas of the human imagination. The images of pagan figures in these astronomical books exerted a strong influence on the readers beyond scientific studies. In the memory of the monks who worked at Fleury these images were dispersed throughout Europe.

One of the most famous abbots of Fleury was Abbo (940/45–1004), who was responsible for writing some important astronomical texts. It is possible that a manuscript with some of the basic works on astronomy was compiled for him. The pictures of the constellations are copies from one of the aforementioned Carolingian luxury manuscripts and were executed by a very talented English draftsman (Fig. 23.3). His work transformed the figures into strange, demonic beings, who in their nakedness hurry around the sky and have little wings on their heads to demonstrate their celestial origins.¹⁶ These drawings are yet another example of the creative transformation of the iconographic tradition connected with ambitious astronomical studies.

In the eleventh century new compendia were compiled at different locations throughout Europe, and these attempted to systematize the growing knowledge in the fields of astronomy and cosmology. In 1056, in the monastery of Ripoll in northern Spain, the monk Oliva compiled a handbook that offered a completely new and systematic organization of the material.¹⁷ For the first time he distinguished the zodiac signs from the constellations and treated them separately as different types of illustrations. He also discussed the planets and created the first images of these wandering stars since antiquity.¹⁸

At the same time, a new commentary was written for the aforementioned poem by Germanicus at the abbey of Montecassino in Southern Italy. Like the monk Oliva in Ripoll, material from different ancient authors was used anew and this work included considerable mythological information. This important work survives as a copy from the twelfth century, with a considerable number of miniatures closely following ancient models.¹⁹ However, new elements are also to be found. At Montecassino, the figure of Eridanus, who is normally shown prostrate as a river-god, is interpreted as the falling Phaeton, who crashes into the river. The miniature shows a naked man with waving legs and arms, similar to a swimmer (Cf. Fig. 23.5). It may be that the inspiration for this new interpretation came from a relief representing the fall of Phaeton on an ancient sarcophagus. The commentary also has a chapter on the South Pole that is impossible to see from Europe, and so the ancient texts offered no information on this important astronomical feature. Using mythological information, the author tried to find concrete information on the *Austronothus* or Southern Pole. Combining remarks from Hyginus and Ovid he offered a picture of a hybrid monster with female upper parts and the body of a female tiger.²⁰ This interesting detail shows the medieval monks' scientific curiosity and demonstrates how ancient myths could offer new solutions for open questions and could expand the thought process.

Throughout the Middle Ages there was a continual search for correct astronomical illustrations and different models were repeatedly balanced. Pictures of the constellations were always an integral part of the design and used to mediate astronomical knowledge. To alleviate the slightly monotonous nature of the star catalogues, the graphic quality of the images was essential for a fuller understanding. It is possible to distinguish three different functions for the images. First, they were didactic and have to be seen as an aid to memory. Second, the images often have information, such as the positions of the single stars or the figures that give the constellations their names, which is not always found in the texts. Third, the images could stimulate the painter's imagination as much as the viewers – and this may have nothing to do with the primary task of the illustration.

In twelfth-century Spain and Sicily, scholars translated scientific works from Arabic into Latin. Astronomy and astrology were the primary interests of these scholars and they opened a new field

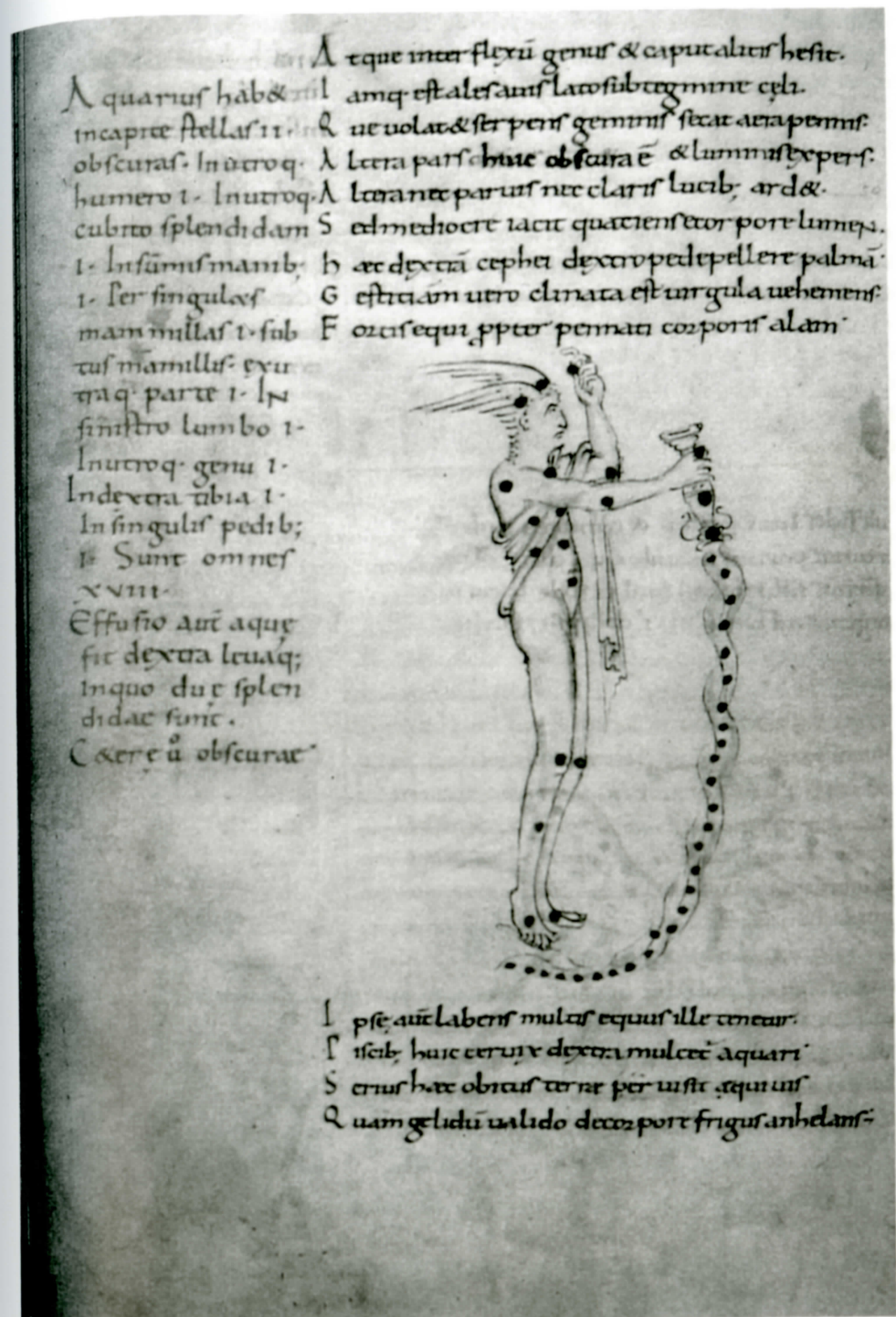


Figure 23.3 Aquarius, London, British Library, Harley Ms. 2506, fol. 38v. © The British Library Board. All Rights Reserved.

of knowledge. Ptolemy's famous work was now available in Latin. Astrology offered a theory that could explain the role of the upper parts of the cosmos in the creation of the world. The practical use of astrology and the calculation of horoscopes were, however, limited in the twelfth century and really developed only in the thirteenth century. Cathedral schools and royal courts replaced monasteries as the centers for these developments.

In Sicily, scholars became acquainted with Abd al-Rahman ibn Umar al-Sufi's book (903–986) written in Bagdad around 964. This large book by the Persian astronomer studied the fixed stars and was famous throughout the Islamic world. It has very detailed images, showing all the stars listed by Ptolemy, in their exact position and appropriately scaled to reflect their size. However, the figures look strange and have now lost their connection to the Greek myths. For the Sicilian scholars these pictures were fascinating, because they showed more stars in their exact positions than any of the other Latin sources. It was easy to compare these pictures to the detailed star catalogue by Ptolemy translated into Latin by Gerhard of Cremona. Therefore they did not translate al-Sufi's extensive text, but instead combined the Islamic images with the Ptolemaic star catalogue and today this book is called *Sifī latinus*. Around 1188–89 a splendid exemplar, which is now unfortunately lost, was made for the Norman king, William II (1166–1189). The oldest surviving copy was made around 1250 in Bologna (Fig. 23.4).²¹ Several additions clearly show

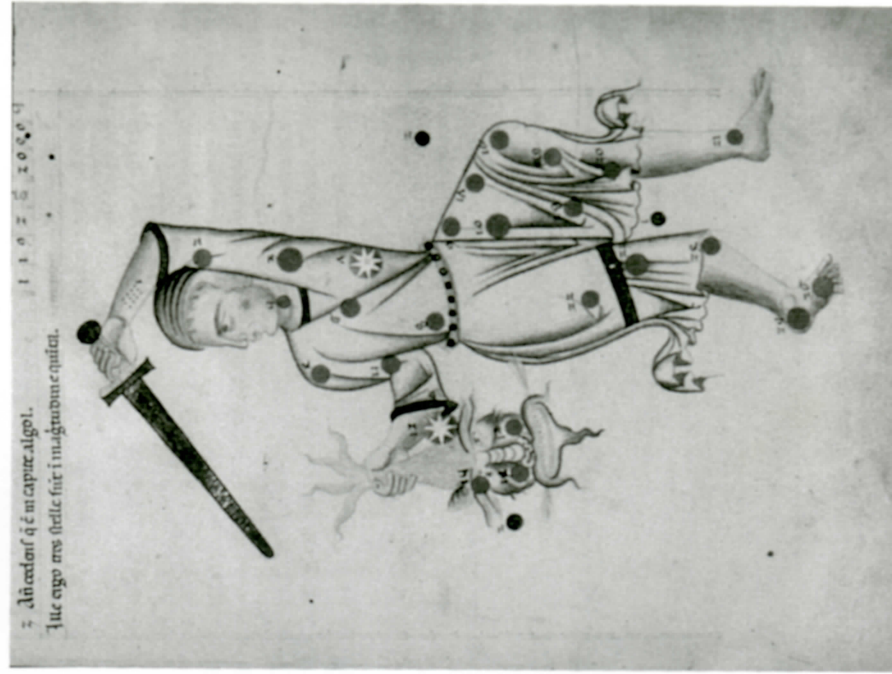


Figure 23.4 Perseus, Paris, Bibliothèque de l'Arsenal, Ms. 1036, fol. 10r.

that astronomers who observed the stars and undertook calculations with the astrolabe used this book on the fixed stars. The miniatures, with their strange appearance, were a sort of mediator between the abstract list of numbers, which gave the position of the single stars, and the visible constellations in the sky. It is astonishing that this spectacular book of the *Sifī latinus* was not more widely circulated and this may have been due to its courtly origins. It was only at the end of the fourteenth century in the Visconti court in Milan that three other copies were produced. However, the intention here was no longer astronomical, as several indices make clear; the interest had shifted to astrology and the occult sciences. One of these manuscripts from Milan was very soon brought to Prague and was used there as the model for the most luxurious book on astrology ever compiled. Apart from the *Sifī latinus* this work also has other important astrological texts and was made for King Wenzel (1361–1419) soon after 1400 as an unusually large format manuscript (47.2 × 34.8 cm).²² In order to read it, it is necessary to turn it around at a ninety-degree angle and look at double-pages (measuring c. 70 × 50 cm) with text and images. For over two centuries, the exoticism of the Islamic images was more or less preserved in the copies. Obviously it was the strange appearance which gave them a specific authority.

The book of al-Sufi was read and translated into Catalan at the Spanish court of King Alfonso X, El Sabio (1252–1284). King Alfonso's interests in the sciences are well known and four large books on astronomy, astrology, and magic were written for him. The *Libro de las estrellas fixas* is a detailed discussion of the constellations and makes extensive use of al-Sufi's work.²³ Every constellation is allocated one page, with a general description on one page and a depiction of the figure in a medallion in the middle, surrounded by a description of the single stars written in a radial system. It appears as if the picture has a sort of aureole. Every page is a sophisticated synthesis of text and image similar to diagrams. The iconography of the constellations is a simplified version of the images from al-Sufi.

Another center for scientific studies was in southern Italy at the court of Emperor Frederic II of Hohenstaufen (1194–1250). Here again there was a special focus on astrology, which was, at that time, a new and fascinating science that offered useful knowledge, especially for rulers. Around 1230, an astrological picture book was compiled there by Georgius Zaporus Zotorus Fendulus, who would be unknown apart from this work. It shows the signs of the zodiac together with the other constellations that rise jointly with them over the horizon – the so-called parantellones – and the planets in an impressive sequence of miniatures.²⁴ Every planet can be seen in four different pictures demonstrating six different positions on the zodiac. The wandering stars are shown as rulers and kings, and in positions where they have little or no influence we see them falling from their thrones. Some attributes refer to particular areas of their activities. Venus, for example, holds a psalter and a drinking vessel, Mercury a book, Mars a sword, and Saturn points to a grapevine. Beside the much simpler images by the monk Oliva from the eleventh century, which have been referred to earlier, these were the first depictions of planets undertaken after antiquity and employed a completely new iconography, which was developed from the long descriptions in the astrological texts that explained the influence of every single planet. It is clear that a wish existed at the court to have images of the important astrological powers for a lay audience who was interested in this new science, but who could not practice it. These miniatures were eminently suitable to promote astrology and to explain its methods in a courtly environment.

More important than this little book by Georgius Fendulus, however, was the work of Michael Scotus (c. 1117–1235), who was connected with the court of Frederic II in the second part of his life.²⁵ He wrote an extensive introduction to astrology and the natural sciences called *Liber introductorius*. An essential chapter is an astrological description of the sky under the title *Liber de signis et imaginibus celi*. This section was frequently handed down as a separate work

and even today it still exists in twenty-two manuscripts. It was the most successful astrological text from the entire Middle Ages.

The starting point for Michael Scotus was the series of miniatures in a manuscript of the Arabic translation by Germanicus as well as the eleventh-century commentary from Montecassino, mentioned earlier. His explanations of the single constellations are like descriptions of the images from this manuscript. These images were very important for him and he took them seriously. A good example is Cassiopeia. In the twelfth-century miniature there is a red wavy line extending downwards from the figure's left hand. This detail is found only in this single miniature and its origins are mysterious. It may represent a decorative band from the dress that was falling down in a gesture of mourning of the crying Cassiopeia. In the Latin translation of Ptolemy, Michael Scotus would have read that Cassiopeia was a woman with a wet or colored hand. He recognized a close relationship between the image and the information from the other text. Therefore he wrote that the right hand was pierced and there was a strong flow of blood similar to Christ on the cross. Even his astrological interpretation stems from this detail. He says that people born under this sign are beautiful and rich, but will suffer a sudden and violent death – and this only because of the red wavy line in the miniature of the Germanicus manuscript.

Another case is Eridanus, who in the Germanicus manuscript he used as a model was shown as a swimmer paralleling the fallen Phaeton who drowned in this river. Michael Scotus wrote that Eridanus was known as a swimmer or a figure who fell into the water but could also be a sitting figure. He added the *Figura sonantis canonum*, a well-dressed man who played a sort of zither as an alternative image (Fig. 23.5). He described Phaeton as the son of the Sun who sat in a wagon and



Figure 23.5 Eridanus und *Figura sonantis canonum*, Vienna, Österreichische Nationalbibliothek, Cod. 2352, fol. 19v.

played this stringed instrument. In this description it is possible to recognize elements of Phaeton before and after his fall. But this may all have resulted from an error in the writing. Canopus, as the brightest star in this constellation, received special attention in most medieval descriptions of the sky and was also often visually represented in the images. In Germanicus's twelfth-century manuscript, however, *Canopus* appears instead of *Canopus*, so it may well have been that Michael Scotus read that a star named *canous* was located there. *Canonus*, however, is an Arabic musical instrument, similar to a zither, and is widely found in the southern Mediterranean countries. Michael Scotus knew it well, and so he simply put this instrument into Eridanus's hands. By doing this he added something from his own experience as well as that of his readers.

Germanicus described forty-two constellations, but Ptolemy has forty-eight. Therefore, Michael Scotus looked for a further six constellations; three of them, including the Southern Pole Astronothus, he found in other miniatures in the twelfth-century codex. The allegorical representation of the Milky Way he called the demon of the midday (*demon meridiamis*), which referred to Psalm 90, verse 6, and posted this new constellation in the southern sky. There he also introduced a second horse, a drill and a flag. The drill and the flag obviously originate from the everyday world. Again he is looking for a strong reference to the experience of his readers.

His interpretation of the planets was based on the description of the influence of these wandering stars in astrological handbooks in a manner similar to that made by Georgius Fendulus. But Michael Scotus offered significantly more detail and also distinguished the single planets. It was astrological influences and not the classical tradition that determined his vision of the celestial bodies. But he was also at pains to be clear and to find points of reference for his readers. Every planet represented a characteristic group in society. Saturn was the farmer in a simple dress. Jupiter could be a judge, bishop, or noble citizen; Mars was a warrior with modern arms, such as the crossbow. Venus was a refined, crowned lady wearing a fine dress and smelling a rose. Smelling the rose, he explained, stood for sensual joy, the fashionable coiffeur for love, and the elegant dress for the art of seduction. When representing her, it is clear that Michael Scotus was well aware that all these details were also used when representing Spring. He used an established picture type, so that meaning could be easily understood. Mercury looks like a university professor in a pulpit with books, but could also be a cleric similar to many intellectuals of his times – not least himself.

All of these image types correspond to the experiential world of the readers, who could immediately get a vivid idea of the planets. Astrology in this way became firmly anchored in their store of experience.

Michael Scotus planned images of the constellations and the planets which do not employ unusual or fantastic beings, but instead there were many connections to the readers' experiences. All of the figures have modern dress and everyday tools which were well known in this period. He avoided inconsistent elements and gave every figure an astrological explanation that justified their appearance. So his *Liber de signis et imaginibus celi* was a popular handbook for laypeople who wanted to understand the basic outlines of the astrological system and to be provided with clear guidelines. This is probably the reason for the great success of the text and images, which were copied in the Renaissance and were finally distributed in a printed version by Erhard Ratdolt in Augsburg in 1491.²⁶

Written in a courtly environment, Michael Scotus's book was widely circulated in the cities of northern Italy from the second half of the thirteenth century onwards. At the beginning of the fourteenth century it was also known in Germany, England, and Bohemia.²⁷ This work represented a dynamic shift in audience which is also characteristic of the bigger history of science in the high Middle Ages. Knowledge was first elaborated at court, promoted by a ruler or king, and was transferred in a second step to a wider audience based in the city. In such a context, knowledge was further developed and found a wider circulation.

Notes

- 1 This chapter is based on two extensive publications, which cover images of constellations from 800 to 1500. Notes here are reduced to a minimum, and for more detailed information see D. Blume, M. Hafner, and W. Metzger, *Sternbilder des Mittelalters: Der gemalte Himmel zwischen Wissenschaft und Phantasie*, part I 800–1200 (Berlin, 2012), and D. Blume, M. Hafner, and W. Metzger, *Sternbilder des Mittelalters und der Renaissance: Der gemalte Himmel zwischen Wissenschaft und Phantasie*, part II 1200–1500 (Berlin, 2016).
- 2 Homer, *Ilias*, 18, 484–90; Homer, *Odyssey* 5, 270–77; Hesiod, *Erga*, 384, 564, 597, 609, 615, 619.
- 3 Hieronymus, *Commentarium in Amos Prophetam*, Lib. II, 7/9, 274–83: “Quando autem audimus Arcturum et Oriona, non debemus sequi fabulas poetarum, et ridicula ac portentosa mendacia, quibus etiam caelum infamare conantur, et mercedem stupri inter sidera collocare.” (If we hear about Arcturum and Oriona, we should not follow the fables of the poets, which tells ridiculous and ugly lies, with them they shame even the heaven and put the reward of disgrace under the stars.)
- 4 F. Wallis, *Bede, the Reckoning of Time* (Liverpool, 1999); C. W. Jones, *Beda Venerabilis, De Ratione Temporum*, Beda Venerabilis opera, vol. 6.2 (Turnhout, 1977).
- 5 A. Borst, *Die karolingische Kalenderreform* (Hannover, 1998), cf. also B.S. Eastwood, *Ordering the Heavens, Roman Astronomy and Cosmology in the Carolingian Renaissance* (Leiden, 2007).
- 6 Blume, Hafner, and Metzger, *Sternbilder I 800–1200* (as in note 1), 43–51.
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- 17 Rome, Biblioteca Apostolica Vaticana, Ms. Vat. Reg. lat. 123; Blume, Hafner, and Metzger, *Sternbilder I 800–1200* (as in note 1), 100–02, Cat.-Nr. 55.
- 18 D. Blume, *Regenten des Himmels, Astrologische Bilder in Mittelalter und Renaissance* (Berlin, 2000), 15–17.
- 19 Madrid, Biblioteca Nacional, Ms. 19; Blume, Hafner, and Metzger, *Sternbilder I 800–1200* (as in note 1), 102–06, Cat.-Nr. 32. The new commentary is also known under the name “Scholia Stroziana.”
- 20 Hyginus (*De astronomia* II, 1, 5) writes that Thetys, the wife of Oceanos, refused to accept the constellation of the great bear or Callisto in the waves. So the scholar of Montecassino thought that Thetys was in opposition to the northern pole and identified her with the southern pole. Ovid (*Metamorphoses* XI, 243ff) tells the story that Thetis was raped by Peleus and tries in vain to escape with some metamorphoses, among others, as a female tiger. But our scholar didn't recognize that Thetys and Thetis are not the same person.
- 21 Paris, Bibliothèque de l' Arsenal, Ms. 1036, Blume, Hafner, and Metzger, *Sternbilder II 1200–1500* (as in note 1), Chap. 4, Cat.-Nr. 34; P. Kunitzsch, “The Astronomer Abu'l-Husayn al-Sufi and His Book on the Constellations,” *Zeitschrift für Geschichte der arabisch-islamischen Wissenschaften* 3 (1986), 56–81.
- 22 Munich, Bayerische Staatsbibliothek, clm 826, Blume, Hafner, and Metzger, *Sternbilder II 1200–1500* (as in note 1), Cat.-Nr. 38.

- 23 Rome, Bibliotheca Apostolica Vaticana, Ms. Lat. 8174, Blume, Hafner, and Metzger, *Sternbilder II 1200–1500* (as in note 1), Cat.-Nr. 44.
- 24 Paris, Bibliothèque Nationale, Ms. Lt. 7330, Blume, *Regenten* (as in note 15), 34–46; Blume, Hafner, and Metzger, *Sternbilder II 1200–1500* (as in note 1), Chap. 2, Cat.-Nr. 1.
- 25 Blume, *Regenten* (as in note 18), 52–69; S. Ackermann, *Sternstunden am Kaiserhof, Michael Scotus und sein Buch V on den Bildern und Zeichen des Himmels* (Frankfurt, 2009); Blume, Hafner, and Metzger, *Sternbilder II 1200–1500* (as in note 1), Chap. 3.
- 26 Blume, Hafner, and Metzger, *Sternbilder II 1200–1500* (as in note 1), Chap. 8, Cat.-Nr. 137.
- 27 Blume, Hafner, and Metzger, *Sternbilder II 1200–1500* (as in note 1), Chap. 2, Cat.-Nr. 8–13.