Certissima signa
A Venice Conference on Greek and Latin Astronomical Texts
edited by Filippomaria Pontani

Texts and Illustrations in Venice, Biblioteca Nazionale Marciana, ms. Lat. VIII 22 (2760)

Fabio Guidetti
(Humboldt Universität, Berlin, Deutschland)

Abstract The article deals with the images of constellations depicted in the manuscript Lat. VIII 22 (2760) of the Biblioteca Nazionale Marciana in Venice, produced probably in an Anglo-Norman *milieu* in the last quarter of the 12th century. After a short introduction on the manuscript and the texts it contains, the paper focuses on the illustrations of the Carolingian star catalogue known as *De signis caeli*, examining their different iconographic traditions as attested in the surviving copies. While the images in the main recension of the star catalogue clearly derive from a late antique archetype (probably the same that was used also for the so-called *Aratus Latinus*), the Venetian copy belongs to a group of manuscripts with a very different set of illustrations. The author proposes that this second recension is a Carolingian creation, invented between the late 8th and the early 9th century through contamination with the iconographic tradition of Germanicus' *Aratea*. In this group of manuscripts, the original late antique set of illustrations was replaced by a new one, in order to give the star catalogue more consistency and to obtain a more effective tool for the study of the constellations.

Keywords Medieval astronomy. Aratus. Aratean tradition. Constellations.

The manuscript Lat. VIII 22 (2760) is among the most famous astronomical manuscripts preserved in the Biblioteca Nazionale Marciana in Venice (BNM).[1] Consisting of 42 folios and written probably in the last quarter of the 12th century, this book entered the Biblioteca Marciana in 1792, as part of the bequeathal of the Venetian nobleman, writer and collector Tommaso Giuseppe Farsetti.[2] The book was already in Farsetti's possession in 1771, when it was included in the catalogue of his collection.[3] We have

1 For a comprehensive treatment of this manuscript see at least McGurk 1966, 84-85; Blume, Haffner, Metzger 2012, 1, 530-35, cat. no. 62.

2 The provenance is stated in a note on the opening flyleaf: "Provenienza Farsetti, Tommaso Gius.". On Farsetti's life and works see Preto 1995.

3 Farsetti, Morelli 1771, 132: "LXXVIII. cod. memb. in 4. del sec. xv. Liber de Astronomia. Com. *Spera Coeli quater senis horis*, &c. In questo si riferisce un dialogo fra Nemroch Discepolo, e Gioantone Maestro, intorno a materie d'Astronomia; senza che vi si veda l'Autore, che forse fu qualche Arabo. Vi sono molte figure appartenenti alla materia trattata, dipinte con grande semplicità".

Antichistica 13
DOI 10.14277/6969-165-2/ANT-13-6 | Submission 2017-01-13 | Acceptance 2017-03-31
ISBN [ebook] 978-88-6969-165-2 | ISBN [print] 978-88-7543-440-3

no information on the history of the manuscript prior to 1771: against the traditional hypothesis of a northern Italian production, Isabelle Draelants has recently attributed it to an Anglo-Norman *milieu* (Draelants 2017 and forthcoming). However, the presence of some notes written by a 15th century Italian hand attests to a rather precocious arrival of the book in Northern Italy.

The manuscript is a short astronomical and computistical miscellany, originally consisting of three texts, written by the same hand, all of them provided with illustrations:

1. fol. 1*r*: Pacificus of Verona, *Versus de horologio nocturno* (*incipit*: *Spera celi quater senis*);
2. fols 1*r*-31*r*: *Liber Nemroth* (title: *Incipit liber de astronomia*);
3. fols 31*v*-36*r*: pseudo-Bede, *De signis caeli* (*incipit*: *Helix arctus maior*).

The last folios of the *codex* contain some later additions. Already in the 13th century a computistical text, with the title: *Incipit doctrina compoti*, was copied on fols 37*r*-38*r* and 39*r*/*v*,[4] followed by some musical diagrams (fols 40*r*-41*r*). Further additions, probably from the 14th and 15th centuries, took up the blank spaces: some sentences excerpted from classical poets, provided with moral interpretations, on fol. 36*v*; weather prognostics on fol. 38*v*; computistical calculations on fols 38*r*/*v* and 41*v*.

The manuscript opens with a *rhythmus*, whose first line reads: *Spera celi quater senis horis dum revolvitur*, describing the design and the working principle of a night clock. This was an instrument for the measuring of time, based on the observation of the movement of a circumpolar star, which is called *noctium horarum Computatrix* (the reckoner of the hours of the night).[5] The text is followed by an illustration showing the use of this instrument (fig. 1): a man, clearly identifiable as a monk thanks to the habit and the tonsure, is looking towards the polar star through a tube mounted on a vertical stand; a circular diagram is attached to the end of the tube, showing the solstices and equinoxes, in order to adjust the measurements to the duration of the night in the different months of the year. The *rhythmus* was written by Pacificus of Verona, who is also credited to be the inventor of this astronomical instrument. Serving as archdeacon in the Verona cathedral in the first half of the 9th century, Pacificus is a fascinating figure of the Carolingian cultural revival: the main source about his life and works is his funerary inscription, dated AD 846, still preserved (in a 12th century re-carving) in the Verona cathedral, which ascribes to

4 "Nachtrag des 13. Jhs." according to Blume, Haffner, Metzger 2012, 1, 531.

5 The standard edition of the poem, based on the version included in the manuscript Città del Vaticano, Biblioteca Apostolica Vaticana, ms. Vat. lat. 644, can be found in *PLAC*, 4, 692; on the functioning of Pacificus' night clock see Wiesenbach 1993; Wiesenbach 1994; Stella 2014.

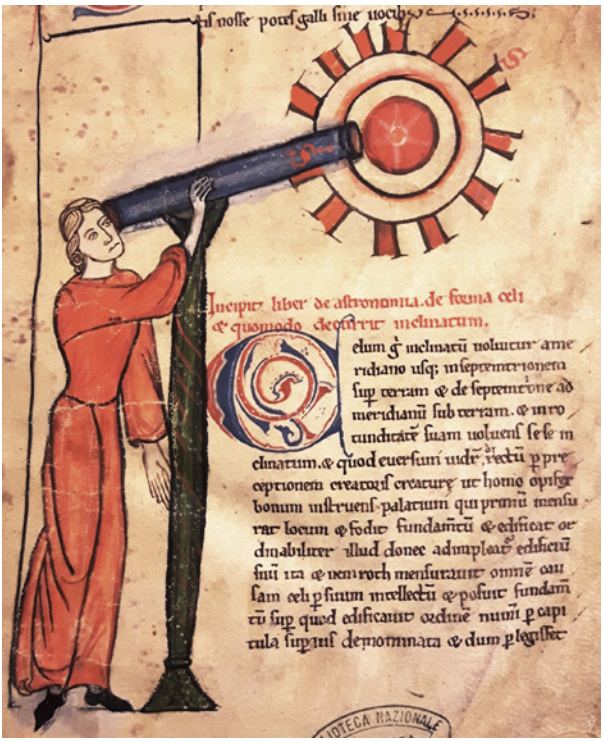

Figure 1. A monk measures the hours of the night using Pacificus' *horologium nocturnum*. Venezia, BNM, ms. Lat. VIII 22 (2760), fol. 1*r*. Northern France or England, last quarter of the 12th century (with permission of the MiBACT)

him an exceptional activity in the restoration of religious buildings, the organization and direction of the cathedral *scriptorium*, and the pursuing of various artistic and scientific enterprises. Pacificus' personality has been re-evaluated in recent years (Marchi 2002, Stella 2014), as a reaction to the thought-provoking book by La Rocca 1995 (whose conclusions are restated in La Rocca 1996 and 2000), which had cast doubt on the reliability of the information found in the funerary inscription. According to La Rocca, Pacificus as a patron and scientist was a 12th century fabrication of Veronese collective memory, which transformed a quite obscure Carolingian priest into a cultural leading figure, with the aim of highlighting the importance of the city's past and of legitimising the authority of the bishop in relation to the cathedral chapter and the lay civic institutions. But, as Francesco Stella recently pointed out, "la sua [i.e. La Rocca's] ricostruzione, basata quasi soltanto su documentazione archivistica, omette proprio le attestazioni poetiche dell'attività di Pacifico, che sono invece databili senza dubbio al IX e non al XII sec." (2014, 189), as witnessed by a number of astronomical and computistical manuscripts. "È possibile e, direi, quasi fisiologico che la sua figura sia stata mitizzata o almeno en-

fatizzata per rafforzare l'identità storica nel XII sec. e, soprattutto, in Età Moderna, ma questo non è sufficiente a dimostrare l'infondatezza dei dati storici pervenuti né a confutare attribuzioni di testi finora non soggette a contestazioni" (2014, 189). Despite the huge amount of studies devoted to his personality and works,[6] Pacificus still awaits a fuller understanding as a historical figure, poet and scientist: the new edition of his writings, currently in preparation by Stella for the *Edizione nazionale dei testi mediolatini*, will hopefully shed new light on the literary and astronomical achievements of this much debated Carolingian scholar.

While waiting for a more reliable edition of Pacificus' *rhythmus* on the night clock, I will concentrate here on its association with the main text included in the Venetian manuscript, the anonymous astronomical treatise known as *Liber Nemroth*. The Venice *codex* is one of the four manuscripts which preserve a more or less complete version of this text,[7] which is currently being studied by Isabelle Draelants.[8] According to the most widely accepted interpretation, the *Liber Nemroth* is a text of eastern, probably Syriac, origin, written sometime between the 6th and the 8th century, which was translated into Latin at the latest by the second half of the 8th century. At the end of the 8th or the beginning of the 9th century, the text underwent a substantial revision, which expunged the chapters dealing with astrological matters (now preserved only as excerpts in miscellaneous manuscripts) and integrated the remaining astronomical sections with materials taken from the Aratean tradition. The text as it now stands is made up of 110 chapters, interspersed with unnumbered excerpts (usually taken from other works, in most cases Bede's *De natura rerum*) and provided with ca. fifty illustrations, mainly circular diagrams. Among the Aratean materials which were associated to the *Liber Nemroth* in the Carolingian period, the most conspicuous addition is by far the star catalogue known as *De signis caeli*, previously also attributed to Bede. This is a short text, derived from the tradition of the *Aratus Latinus*, listing the ancient Graeco-Roman constellations and the main stars contained in each of them, and equipped with forty illustrations.

6 A recent survey of the numerous studies on Pacificus and his works can be found in Valtorta 2006, 177-81.

7 The other manuscripts are: Città del Vaticano, Biblioteca Apostolica Vaticana, ms. Pal. lat. 1417 (early 12th century); Paris, Bibliothèque Nationale de France, ms. Latin 14754, fols 203*r*-229*r* (mid-12th century); Torino, Biblioteca Civica Centrale, Fondo Antonio Bosio, ms. B.176 (end of the 13th century).

8 Haskins 1924, 336-45; van de Vyver 1936, 684-87; Livesey, Rouse 1981; Obrist 1994; Obrist 1997, 77-83; Juste 2004; Gebner 2008; Obrist 2011; Blume, Haffner, Metzger 2012, 1, 142-43; Draelants 2017; Draelants forthcoming. I thank Isabelle Draelants for her generous suggestions and for allowing me to read her still unpublished contributions. A whole branch of studies deals specifically with the relation between the *Liber* and the character of Nemroth in Dante's *Inferno*: see at least Lemay 1963; Lemay 1965; Nardi 1966, 367-76; Dronke 1986, 43-46 and 112-24; Ciccuto 2003.

The association of texts found in the Venice manuscript (Pacificus' *rhythmus* on the night clock – *Liber Nemroth* – *De signis caeli*) is not unique. As Charles Haskins had already recognised, the association of the *Liber Nemroth* with the *rhythmus* on the night clock is also attested in the 13th century by the *Speculum astronomiae* attributed to Albertus Magnus, who quotes the words *Sphaera coeli* as the *incipit* of Nemroth's astronomical treatise:[9] apparently a branch of tradition existed, in which Pacificus' poem, explaining how to build an instrument capable of improving the observation of the sky, was used as a sort of technical introduction to the main treatise. It is possible that the Paris manuscript of the *Liber Nemroth* (BNF, Latin 14754), written probably in Chartres, originally contained the same association of texts, but unfortunately here the beginning of the treatise is incomplete: the first ten chapters are lacking, and the text opens with chapter XI (entitled *De locis signorum*).[10] In the Palatine *codex* now in the Vatican, on the contrary, the beginning of the *Liber Nemroth* is preceded by a short excerpt taken from book 18 of the *De civitate Dei* (Aug. *ciu.* 18.39), where Augustine speaks of Atlas, *magnus astrologus*, identifying him as a contemporary of Moses and the brother of Prometheus, and tracing his offspring down to Hermes Trismegistos. The excerpt on Atlas serves the purpose of juxtaposing the biblical tradition, represented by Nemroth, to the pagan classical astronomy, as symbolised by the images of the two mythical astronomers drawn at the bottom of the first folio.[11] More clearly documented is the association of the *Liber Nemroth* with the star catalogue *De signis caeli*, which appears in three manuscripts. The star catalogue follows immediately the *Liber Nemroth* in both the Venice and Paris manuscripts (fols 31*v*-36*r* and 229*v*-232*v*, respectively), but it was once included also in the Pal. lat. 1417: as pointed out by van de Vyver (1936, 686-87 note 140), the summary of the latter manuscript, written by a 15th century hand on its fol. 1*r*, lists as its first entry a "libellus pulcer Besde de situ et dispositione stellarum et signorum coeli", followed

9 Borgnet 1890-99, 10, 631: "Ex libris ergo qui post libros geometricos et arithmeticos inveniuntur apud nos scripti super his, primus tempore compositionis est liber quem edidit Nembroth gigas ad Iohathonem discupulum suum, qui sic incipit: *Sphaera coeli*, etc., in quo est parum proficui, et falsitates nonnulle; sed nihil est ibi contra fidem quod sciam". Cf. Haskins 1924, 338.

10 For bibliographical references on the manuscript up to 2010 see the catalogue entry on the website of the Bibliothèque Nationale de France: `http://archivesetmanuscrits.bnf.fr/ark:/12148/cc75500d`, with a link to the digitised version available on the *Gallica* database.

11 The caption of the left figure says "Atlas magnus astrologus, rex Ispanensium, regens humeris suis celum inclinatum cum stellis", standing on the "Pireni montes"; the caption of the right figure says "Nemroth inspector celorum ac rex Caldeorum, regens manibus suis celum inclinatum sine stellis", standing on the "montes Amorreorum". The ms. Pal. lat. 1417 is fully digitised on the website *Bibliotheca Palatina–digital* of the Universitätsbibliothek Heidelberg: `http://digi.ub.uni-heidelberg.de/de/bpd/index.html`.

by other astronomical texts; thanks to this summary we know that the *codex* as it stands today, made of only 19 folios containing only the *Liber Nemroth*, was originally the first section of a more complex astronomical miscellany including also the *De signis caeli*. Thus, we can conclude that the star catalogue *De signis caeli* was originally used as a standard complement to the *Liber Nemroth*: this is hardly surprising, since the information available in the star catalogue provides a useful addition to the astronomy contained in the *Liber*, which does not include a thorough treatment of the constellations.[12]

Leaving a more detailed analysis of the texts contained in the Venice manuscript to the scholars who are preparing their editions, in the present paper I will focus on the images of the constellations included in the star catalogue *De signis caeli*. Since I am no medievalist, I do not have the capacity of addressing them from a stylistic point of view: I leave this task to historians of medieval book illustration, in the hope that they can say something more precise about the time and place of production of the manuscript. On the contrary, I will study these images from the point of view of their iconography, examining their relationship with both the text they accompany and the ancient models from which they ultimately derive. These materials, both textual and visual, are part of the so-called Aratean tradition, a complex stratification of texts and images aggregated over more than seven centuries (from the 3rd century BC to the 4th century AD) around the astronomical poem *Phaenomena*, written by the Greek poet Aratus of Soli in the 3rd century BC. This poem, containing a description of the stars and constellations visible in the sky, was a true best-seller throughout Greek and Roman antiquity: it was considered an essential part of the education of the upper classes in the Hellenistic and Imperial periods, while its quotation, attributed to Paul in his Athenian speech in the Acts of the Apostles, assured its success also among a Christian audience. Aratus' poem was translated into Latin several times between the 1st century BC and the 8th century AD; and, at least from the Roman imperial period, commented and illustrated editions were produced, both in the original Greek and in Latin translation. A handful of ancient astronomical manuscripts which survived into the early medieval West were in fact exemplars of these commented and illustrated editions of Aratus' *Phaenomena*. For the time being, I will narrow down my focus to the materials which were available in the Carolingian period: because it is in this period, between the late 8th and the early 9th century, that the text of the star catalogue *De signis caeli* and its illustrations were produced.

12 For this reason, on fol. 1*r* of the ms. Pal. Lat. 1417, Nemroth is depicted as "regens… celum inclinatum sine stellis", while the stars and constellations are regularly present in the 'pagan' sky carried on his shoulders by Atlas.

A comparative study of the texts and illustrations preserved in the extant medieval Aratean manuscripts allows us to identify four branches of the medieval tradition, each one derived from an ancient illustrated book (fig. 2). These books were presumably part of private aristocratic libraries in late Roman Gaul, and with the collapse of Roman administration during the 5th century they passed into ecclesiastical property, either by bequeathal or by simple continuity of ownership (for many late antique Gallic bishops were, in fact, local aristocrats). During the early period of the Frankish kingdom these books were preserved by ecclesiastical institutions as luxury items, until the 8th century, when they started to be studied and copied. Two of these books were specimens of what Jean Martin, in his reconstruction of the history of the Aratean tradition, called the 'Φ edition' of the *Phaenomena*:[13] in these books Aratus' poem was accompanied by an extensive astronomical and mythological commentary, equipped with ca. 50 illustrations. Judging from the iconography of the constellations as preserved in their extant medieval copies, these two manuscripts were exemplars of the late antique revision of the 'Φ edition', produced probably in the 4th or early 5th century AD: one of them was written in Greek, and it is the ancestor of the manifold tradition of the so-called *Aratus Latinus*; the other one was a Latin translation, which can be recognized as the archetype of the *O* family of Germanicus' *Aratea*. The other two manuscripts were probably contemporary with the two already mentioned, but they did not contain the 'Φ edition'. They can be recognized as the direct models of two of the most extraordinary luxury manuscripts written at the Carolingian court, namely the Leiden *Aratea* (a lavishly illustrated edition of the Latin translation of Germanicus without commentary, and the archetype of Germanicus' *Z* family); and the ms. Harley 647 of the British Library, containing a large fragment of Cicero's translation of the *Phaenomena*, with a commentary made of excerpts from Hyginus' treatise *De astronomia*.

Leaving aside the aesthetic fascination for these luxury court manuscripts, I would like to examine more closely the textual tradition of the two versions – the Greek and the Latin one – of the 'Φ edition', as reconstructed by the studies of Antonio Dell'Era and Hubert Le Bourdellès.[14] According to Le Bourdellès, the Greek version of the 'Φ edition' was translated into Latin probably in the monastery of Corbie, in northern France, already in the second quarter of the 8th century. This translation, known as the *Aratus Latinus*, was made by someone who had a very poor knowledge of

13 Martin 1956, 35-126.

14 See the critical editions of the Aratean commentaries by Dell'Era 1974, *De ordine ac positione stellarum in signis*; Dell'Era 1979a, *Scholia in Germanicum Basileensia*; Dell'Era 1979b, *De signis caeli*; Dell'Era 1979c, *Scholia in Germanicum Strozziana*. Le Bourdellès 1985 is the most recent comprehensive study of the tradition of the *Aratus Latinus*, seen from the point of view of a medievalist.

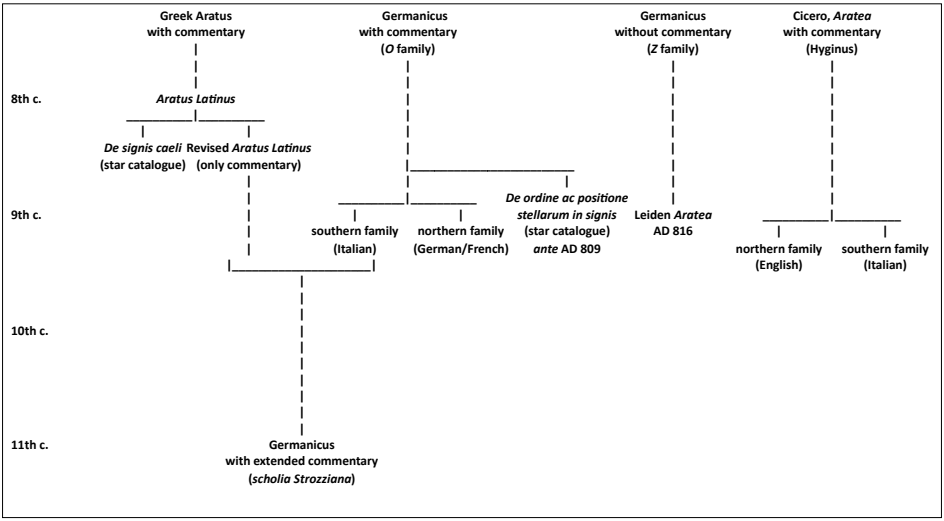

Figure 2. A scheme of the transmission of the Aratean tradition from Late Antiquity into the Latin Middle Ages

Greek, with the aid of some Greco-Latin *glossaria* which proved largely insufficient for the task: the text thus produced was almost unintelligible, especially the translation of Aratus' complex allusive poetry. For this reason, in the last decades of the 8th century this first attempt underwent an extensive revision, which ultimately produced two brand-new texts: on the one hand, a new version of the *Aratus Latinus*, now including only the commentary and not the main poetic text; on the other hand, a star catalogue, conventionally known today by the title *De signis caeli*, which extrapolated from the commentary only the sections dealing with the positions of the stars within each constellation, leaving aside all the mythological stories, as well as the astronomical introductory materials. A large number of manuscripts of both these texts are illustrated with an almost identical set of images, clearly derived from their common late Roman model.

16 illustrated manuscripts of the star catalogue *De signis caeli* are known today, all of them displaying the same sequence: every constellation is described, first, by a text listing its main stars, then by an image outlining its general shape. The illustrations of the star catalogue can be classified, on the basis of iconographic criteria,[15] into two main recensions: one has a set of illustrations which look very close to their late Roman

15 The main work on this subject has been done by Kristen Lippincott, and the following thoughts are based heavily on her classification, although with some changes. The results of Kristen Lippincott's studies can be found in the website of her *Saxl Project*: `http://www.`

models, while the second one varies the traditional iconographies in a quite creative way. The most characteristic manuscript of the first group is ms. Latin 5543 of the Bibliothèque Nationale de France, written in the mid-9th century in the monastery of Fleury, in the valley of the Loire, and probably completed in the first half of the 10th century:[16] this manuscript displays the typical layout of a late Roman illustrated *codex*, with the images taking the full width of the page and surrounded by a thick rectangular frame. The iconographies of the individual constellations, too, look very close to the ancient models: indeed, they offer a somewhat simplified version of those found in ms. Vat. gr. 1087, written in Constantinople in the first half of the 14th century, which, in turn, were copied from another specimen of the same, aforementioned late antique 'Φ edition'.[17] The superior artistic quality of these Byzantine drawings must be ascribed not only to the work of a first class artist, but also to the fact that the images of Vat. gr. 1087 were probably copied directly from an ancient model; on the contrary, before being included in ms. Par. Lat. 5543, the late Roman illustrations of the *De signis caeli* had already undergone a long process of copying, from the 8th to the 10th century, which had led to some iconographic *naïvetés* and misunderstandings. At any rate, this set of images appears to be the most common among the illustrated manuscripts of both the star catalogue *De signis caeli* and the revised version of the *Aratus Latinus*, and it must therefore be considered as deriving from their common ancestor, i.e. from the late antique Greek *codex* of Aratus' 'Φ edition' which was translated into Latin in Corbie during the 8th century, and which was the common archetype of this whole branch of the medieval western tradition.

The Venice manuscript, on the contrary, carries a completely different set of illustrations, which is found in a group of six manuscripts, ranging from the 9th to the 13th century and spread from northern Italy to England.[18] 6 manuscripts out of 16 is actually a rather high percentage for a

kristenlippincott.com/the-saxl-project. Lippincott's classification of the constellation cycles is more complete and more functional than the one proposed by Duits 2005.

16 The original, computistical section of the manuscript is dated AD 847, the folios containing the star catalogue *De signis caeli* are a later, 10th century addition: cf. at least Borst 2006, 1, 270-71; Blume, Haffner, Metzger 2012, 1, 87-89 and 422-29, cat. no. 44. Further bibliographical references are included in the catalogue entry in the website of the Bibliothèque Nationale de France: http://archivesetmanuscrits.bnf.fr/ark:/12148/cc64506m, with a link to the digitised version in the *Gallica* database.

17 On this manuscript see now Guidetti, Santoni 2013.

18 The group consists of the following manuscripts: Padova, Pontificia Biblioteca Antoniana, ms. 27, fols 130*v*-133*v* (Verona, late 9th-early 10th century); Dijon, Bibliothèque Municipale, ms. 448, fols 67*v*-71*r* (Burgundy, early 11th century); Durham, Chapter Library, ms. Hunter 100, fols 62*r*-64*v* (Durham, early 12th century); Paris, Bibliothèque Nationale de France, ms. Latin 14754, fols 229*v*-232*v* (Chartres, mid-12th century); Venezia, Biblioteca Nazionale Marciana, ms. Lat. VIII 22 (2760), fols 31*v*-36*r* (Northern France or England,

Figure 3. Opening folio of the star catalogue *De signis caeli.* Venezia, BNM, ms. Lat. VIII 22 (2760), fol. 31*v*. Northern France or England, last quarter of the 12th century (with permission of the MiBACT)

Figure 4. Opening folio of the star catalogue *De signis caeli*. Padova, Pontificia Biblioteca Antoniana, ms. 27, fol. 130*v*. Verona, early 10th century (with permission of the Pontificia Biblioteca Antoniana)

'secondary' tradition: this alternative set of illustrations, in other words, is not as rarely attested as we could expect in comparison with the main recension, namely that of the ancient model from which the text is also derived. If the success of the main recension finds its legitimation in the authority of its model, and in the conservatism of the copying process itself, we will have to find a reason for the creation and spreading of the second set of illustrations. An analysis of the distribution of text and images, as well as of the iconographies of the constellations in this group of manuscripts will lead us to some hypotheses.

In all six manuscripts of this group, the star catalogue *De signis caeli* shows the same layout, which is very different from the late Roman arrangement found in the Fleury *codex*: the text is now written in two columns, the illustrations are considerably smaller and they are not surrounded by any kind of frame. In four out of six manuscripts (including the one in Venice) the stars are marked on the image of each constellation, but their arrangement does not match the real positions of the stars in the sky: that is to say, the stars have been marked on the constellation images by meticulous scribes on the basis of the corresponding texts, without any reference to direct observation of the sky.

The impression that the marking of the individual stars should be interpreted as a scribal addition is also corroborated by the absence of this feature in the oldest manuscript of this group, namely the late Carolingian computistical miscellany written probably in Verona between the end of the 9th and the beginning of the 10th century, and acquired in the first half of the 15th century by the monastery of St. Anthony in Padua, where it is still preserved.[19] The important differences in the text of the *De signis caeli* between the Padua and the Venice manuscripts rule out the possibility of a derivation of the latter from the former:[20] nonetheless, the two

last quarter of the 12th century); Oxford, Bodleian Library, ms. Laud misc. 644, fols 8*r*-10*v* (Bayeux, second half of the 13th century).

19 Padova, Pontificia Biblioteca Antoniana, ms. 27. For a detailed description of the manuscript and its content see McGurk 1966, 64-72; Abate, Luisetto 1975, 28-33. A description and a bibliography up to 2010 can be found in the website *Nuova biblioteca manoscritta – Catalogo dei manoscritti delle biblioteche del Veneto*: `http://www.nuovabibliotecamanoscritta.it`; among the most recent publications, one should add at least Ó Cróinín 2010, 331-44. On the astronomical illustrations of the *De signis caeli*, copied in the last *folios* of the manuscript, see especially Toniolo 2004; Blume, Haffner, Metzger 2012, 1, 410-14, cat. no. 42. I hereby express my warmest thanks to the Director of the Pontificia Biblioteca Antoniana, father Alberto Fanton, for his invaluable assistance during the consultation of the manuscript.

20 Apart from the numerous textual variants, the most conclusive evidence is provided by a *lacuna* on fol. 133*r* of the Padua manuscript, where the chapter on the constellation of Hydra is lacking and a blank space is left on top of the corresponding illustration; the chapter is regularly present in the Venice manuscript, fol. 36*r*, which must thus derive from another source.

Figure 5. *Constellation of Draco.* Venezia, BNM, ms. Lat. VIII 22 (2760), fol. 31*v*. Northern France or England, last quarter of the 12th century (with permission of the MiBACT)

Figure 6. *Constellation of Draco.* Padova, Pontificia Biblioteca Antoniana, ms. 27, fol. 130*v*. Verona, early 10th century (with permission of the Pontificia Biblioteca Antoniana)

manuscripts share a characteristic detail in their layout, which does not appear in any other witness of the same group. In the Venice manuscript, the first entry of the *De signis caeli*, presenting the constellation of Ursa Maior, is initially written on one column, taking up only two lines of text; then, the scribe decided to shift to a two-column layout, in order to save space: thus, the image of Ursa Maior was drawn in the left half of the page, leaving space in the right column for the text of the second constellation entry, Ursa Minor. This decision, however, caused a problem, for as a consequence the scribe continued to use the right column for the entries about Ursa Minor and Draco, then placing the fourth and fifth constellations, Hercules and Corona Borealis, in the left column which he had previously left blank. As a result, the reader is now faced with the wrong sequence: Ursa Maior – Hercules – Corona Borealis – Ursa Minor – Draco (fig. 3). Significantly, this problem in the layout of the first page is also found in the Padua manuscript (fig. 4): here, too, the scribe started out by copying the text in one broad column, and only after the third constellation he realised that he could save space by shifting to a two-column layout. This change of mind regarding the layout, occurring in two manuscripts which

Figure 7. *The circumpolar constellations.* Basel, Universitätsbibliothek, ms. AN IV 18, fol. 14*r*. Fulda, ca. AD 820-830 (© Universitätsbibliothek Basel)

do not appear to be immediately derived from one another, points to the fact that, at the origin of this tradition, too, there may easily have been a one-column model: such a conclusion confirms that, despite the evocative similarity of the two-column format to the so-called '*rotulus*-style', the ancient model which gave origin to the whole textual and visual tradition of the *De signis caeli* was actually a one-column late Roman *codex* with lavish full-page illustrations, and the change in favour of a two-column layout was a Carolingian innovation, to be ascribed mainly to economic reasons.

In what follows, I will examine in greater detail some of the constellation images included in the Venice and Padua manuscripts, comparing them with the standard illustrations of the main recension of the *De signis caeli* (as best attested by the Fleury *codex* Par. Lat. 5543), with the aim of better understanding the models used for the creation of this 'alternative' set of illustrations, the criteria of its conception and the reasons for its success. From this point of view, the iconography of Draco is particularly interesting. Draco is usually depicted as a snake winding between the two Bears: accordingly, it appears in the form of a snake in all the extant branches of the Aratean tradition, including the manuscripts of the *De signis caeli*, in both the 'main' and the 'alternative' recension. The illustrator of the Venice manuscript, while drawing the image of Draco on fol. 31*v*, departed from this iconography and replaced the traditional snake with a veritable dragon, shaped like a bird with a snake's tail and flames flowing from its

jaws (fig. 5). This image certainly testifies to the high degree of creativity and independence of this illustrator, who for some reason wanted to draw something closer to what the Latin word *draco* evoked to his own medieval imagination, rather than to accurately follow his model. As it can be noticed, however, in the first version of this illustration the tail of the Dragon was more winding, extending further below, in a way more similar to what was probably found in its model; then, the illustrator decided to shorten the tail and move it upwards, probably as a consequence of the layout problems which we have already mentioned, in order not to cross over into the adjacent left column: and this led him to produce an image that has almost nothing in common with the original iconography.

Perhaps even more interesting, from the point of view of the history of the text, is the fact that, in all extant manuscripts of this second recension of the *De signis caeli*, Draco is always represented alone: the earliest, and most elaborate, version is the one found on fol. 130*v* of the Padua *codex* (fig. 6). This choice is rather uncommon in the iconographic tradition of the *Aratea*: Aratus defines the position of this constellation in relation to the two Bears (Arat. 45-62); as a consequence, the ancient illustrations of the *Aratea* show the three circumpolar constellations together, thus clarifying the importance of their spatial connection. Accordingly, the combination of Draco with the two Bears is a common feature of all the extant branches of the Aratean tradition: it was found not only in the late antique Greek version of the 'Φ edition', as witnessed by the ms. Vat. gr. 1087 (fol. 305*v*) and the main recension of the *De signis caeli*, but also in the Latin version of the same 'Φ edition', as attested by the *O* family of Germanicus; finally, the same illustration also appears in Germanicus' *Z* family, represented by the Leiden *Aratea*.[21] In other words, we can state that in all the ancient astronomical books available to the Carolingian scholars, which were the archetypes of our extant families of manuscripts, Draco was always represented together with the Bears. So, the choice of excerpting it out of this combination, giving it an image for its own, must be regarded as a purposeful variation by the inventor of this alternative set of illustrations.

Significantly, the inception of the same tendency can already be seen in the main recension of the *De signis caeli*: here the images of the two Bears have been extrapolated from the comprehensive illustration of the circumpolar constellations, in order to accompany the corresponding entries of the star catalogue, which otherwise would not have been illustrated. As a result, for example, the Fleury manuscript of the *De signis caeli* shows, at its beginning, the two separate images of the two Bears (fol. 160*r*), fol-

21 Leiden, Universiteitsbibliotheek, VLQ 79, fol. 3*v*; on this famous manuscript cf. at least Blume, Haffner, Metzger 2012, 1, 53-67 and 292-98, cat. no. 23, with further bibliographical references. The illustrations of the circumpolar constellations are not preserved in the tradition of Cicero's *Aratea*, due to its incomplete state.

Figure 8. *Constellation of Hercules.* Basel, Universitätsbibliothek, ms. AN IV 18, fol. 14*v*. Fulda, ca. AD 820-830 (© Universitätsbibliothek Basel)

Figure 9. *Constellation of Hercules.* Venezia, BNM, ms. Lat. VIII 22 (= 2760), fol. 31*v*. Northern France or England, last quarter of the 12th century (with permission of the MiBACT)

Figure 10. *Constellation of Hercules.* Padova, Pontificia Biblioteca Antoniana, ms. 27, fol. 130*v*. Verona, early 10th century (with permission of the Pontificia Biblioteca Antoniana)

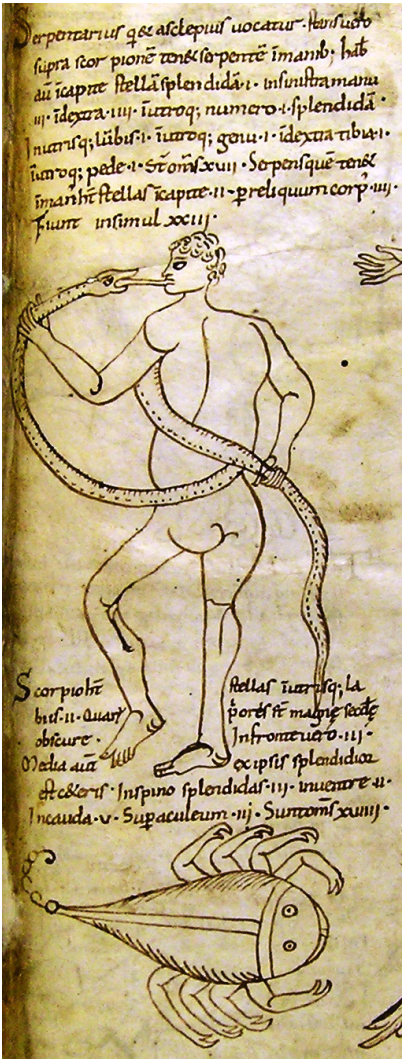

Figure 11. *Constellations of Ophiuchus* and *Scorpius.* Padova, Pontificia Biblioteca Antoniana, ms. 27, fol. 131*r*. Verona, early 10th century (with permission of the Pontificia Biblioteca Antoniana)

Figure 12. *Constellations of Ophiuchus* and *Scorpius.* Venezia, BNM, ms. Lat. VIII 22 (2760), fol. 32*r*. Northern France or England, last quarter of the 12th century (with permission of the MiBACT)

Figure 13. *Constellation of Gemini.* Padova, Pontificia Biblioteca Antoniana, ms. 27, fol. 131*v*. Verona, early 10th century (with permission of the Pontificia Biblioteca Antoniana)

Figure 14. *Constellation of Gemini.* Venezia, BNM, ms. Lat. VIII 22 (2760), fol. 32*v*. Northern France or England, last quarter of the 12th century (with permission of the MiBACT)

lowed on the next page by the traditional Aratean illustration featuring Draco and the Bears together, with the Bears drawn in two different colours in order to distinguish them from one another (fol. 160*v*). Compared with this situation, the second recension of the *De signis caeli* simply eliminates the repetition of the identical images, by removing the two Bears from the third illustration and thus leaving Draco alone. The same simplification is also found in a second Carolingian star catalogue, the slightly later *De ordine ac positione stellarum in signis*, derived from the Latin commentary (the so-called *Scholia Basileensia*) which accompanies Germanicus' translation in the manuscripts of the *O* family. This text was exceptionally widespread in the Carolingian period, thanks to its inclusion in the so-called *Libri computi*, the large computistical encyclopaedia prepared under the auspices of Charles the Great, probably under the direction of Adalhard of Corbie, and published in Aachen in AD 809.[22] Here, too, Draco has been separated from the Bears and appears as an isolated

22 The text of the *Libri computi* is now available in the critical edition by Borst 2006, 3, 1054-334, cat. no. 17 (The *De ordine ac positione stellarum in signis* is chapter 2 of book V, 1251-60).

Figure 15. *Constellation of Gemini.* Basel, Universitätsbibliothek, ms. AN IV 18, fol. 20*r*. Fulda, ca. AD 820-830 (© Universitätsbibliothek Basel)

Figure 16. *Constellation of Auriga.* Basel, Universitätsbibliothek, ms. AN IV 18, fol. 22*r*. Fulda, ca. AD 820-830 (© Universitätsbibliothek Basel)

constellation under the corresponding text, as can be seen in one of the earliest preserved manuscripts, now in Madrid.[23] However, a difference can be noticed between the two star catalogues in the position of Draco: in the manuscripts of the *De ordine ac positione* Draco is drawn vertically, thus keeping the position it has in all the descendants of the Greek 'Φ edition', including the main recension of the *De signis caeli*; on the contrary, in the alternative set of illustrations for the *De signis caeli*, Draco is drawn horizontally. This choice could perhaps be explained merely as a method for saving space, but in my opinion it can also be linked to a specific model: the horizontal Draco is found only in the *O* family of Germanicus, as attested for example in its earliest witness, the *codex Basileensis*, on fol. 14*r*[24] (fig. 7). We can thus formulate the hypothesis that this alternative set of illustrations was created through a contamination of the received set already available in the manuscripts of the *De signis caeli* (that is, the one derived from the Greek late antique 'Φ edition' of Aratus) with the set of the Latin 'Φ edition', as attested in the *O* family of Germanicus' *Aratea*. In the following pages we will back this hypothesis, providing more examples in which such a contamination can be recognised.

The tendency to separate groups of constellations which, in the Aratean tradition, are usually combined with one another is confirmed in the case of Hercules. The normal iconography in the manuscripts derived from the 'Φ edition' shows the hero while fighting against Draco, and thus combines the two constellations in a mythological depiction referring to one of Hercules' twelve labours, the stealing of the golden apples of the Hesperides. This image is found in both the Greek and the Latin versions of the 'Φ edition', as attested respectively by the Fleury manuscript now in Paris (fol. 161*r*) and the Basel *codex* of Germanicus (fig. 8).[25] The il-

23 Madrid, Biblioteca Nacional de España, ms. 3307, fol. 54*v*. The manuscript was probably written in the monastery of Murbach, in Alsace, around AD 820, as the faithful copy of a luxury exemplar produced at the imperial court in Aachen: see at least Borst 2006, 1, 248-49; Blume, Haffner, Metzger 2012, 1, 67-68 and 354-59, cat. no. 33, with further bibliographical references. The manuscript is fully digitised in the website of the *Biblioteca Digital Hispánica*: `http://www.bne.es/es/Catalogos/BibliotecaDigitalHispanica/Inicio/index.html` under the signature Mss/3307.

24 Basel, Universitätsbibliothek, ms. AN IV 18, written ca. AD 820-30, perhaps in the monastery of Fulda: it contains the introductory treatises of the *Aratus Latinus*, followed by Germanicus' *Aratea* with commentary and illustrations; see at least Blume, Haffner, Metzger 2012, 1, 73-74 e 202-07, cat. no. 6, with further bibliographical references. The manuscript is fully digitised in the website of the *Virtual Manuscript Library of Switzerland*: `http://www.e-codices.unifr.ch/en`.

25 The tradition of Germanicus' *Z* family offers no help on this point, because its Hercules (fol. 6*v* of the Leiden *Aratea*) is actually depicted with the attributes of Bootes: the long, curved stick and the short tunic, or *exomis*; perhaps this can be interpreted as the consequence of some errors occurred during the copy of the ancient model. In the manuscripts of Cicero's *Aratea*, as in the other cases mentioned earlier, this illustration is not preserved.

Figure 17. *Constellation of Auriga.* Venezia, BNM, ms. Lat. VIII 22 (2760), fol. 32*v*. Northern France or England, last quarter of the 12th century (with permission of the MiBACT)

Figure 18. *Constellation of Auriga.* Padova, Pontificia Biblioteca Antoniana, ms. 27, fol. 131*v*. Verona, early 10th century (with permission of the Pontificia Biblioteca Antoniana)

lustration found in the manuscripts now in Venice (fig. 9) and Padua (fig. 10) clearly derives from the same tradition: the hero is represented in an identical posture, seen from the back (that is, in globe view), kneeling on his right knee, with the club in his right hand and the lion skin on his left arm. But in these two manuscripts, as in all those of the second recension of the *De signis caeli*, the Dragon and the apple tree have been removed; the same simplification is found, again, in the earliest manuscripts of the other Carolingian star catalogue, the *De ordine ac positione stellarum in signis* (Madrid, Biblioteca Nacional de España, ms. 3307, fol. 55*r*).

In my opinion, this choice cannot be explained away as the consequence of a pious refusal to represent a pagan mythological hero: even without the Dragon and the tree, Hercules is clearly identifiable thanks to his attributes, the lion skin and club. Indeed, I am inclined to give to this choice a scientific rather than an ideological reason: as in the case of Draco, which we have seen earlier, the inventor(s) of this alternative set of illustrations wanted, for the sake of clarity, each constellation to be treated as a single unit. The double illustration of Draco found in the ancient model, first as winding between the Bears and then as fighting against Hercules, was considered redundant: thus, this constellation was removed from its two contexts and given an image of its own. As a result, the two original Aratean illustrations were replaced by four different images. In the first recension of the *De signis caeli* these illustrations represented, respectively: Ursa Maior; Ursa Minor; Ursa Maior, Ursa Minor, and Draco; Draco and Hercules. The second recension eliminates the redundancies and offers a much clearer distinction, with four separate depictions of Ursa Maior, Ursa Minor, Draco, and Hercules.

The same rule applies again in the case of Ophiuchus and Scorpius. In the entire Aratean tradition these two constellations are normally depicted together, with Ophiuchus standing on the back of Scorpius, as described in Arat. 83-86. This combination is also found in the main recension of the *De signis caeli* (Paris, Bibliothèque Nationale de France, ms. Latin 5543, fol. 161*v*): but, as it had already happened with the two Bears, the image of Scorpius is here repeated, as an independent constellation, to illustrate its separate catalogue entry (fol. 162*r*).[26] Exactly as in the case of Draco with the two Bears, in the second recension of the *De signis caeli* and in the *De ordine ac positione stellarum in signis* this duplication is eliminated: Ophiuchus and Scorpius have been given two different images, illustrating their respective catalogue entries as two separate constellations, as found in the Padua (fig. 11) and Venice (fig. 12) manuscripts.

On the other hand, the hypothesis of a contamination of this second recension of the *De signis caeli* with the *O* family of Germanicus (that is, with the Latin version of the 'Φ edition') is confirmed by the image of the constellation of Gemini. The main recension of the star catalogue, again well represented by the Fleury manuscript, identifies the Twins with the Dioscuri, Castor and Pollux (fol. 158*r*): they are depicted here as typical late Roman hunters, dressed with a short tunic, trousers (*bracae*), and a short mantle (*chlamys*), and with spears in their hands; the two figures, clearly separated from one another, are arranged in a symmetrical way. The alternative recension of the same text, on the contrary, as represented in the Padua and Venice manuscripts, clearly follows a different mythological identification: here the Twins are depicted as Amphion and Zethus, as is made clear by the lyre in the hand of one of them.

In the Padua version (fig. 13), the two figures are dressed only with a long *chlamys*, an outfit particularly suitable for late Roman heroes; on the contrary, the illustrator of the Venice manuscript (fig. 14) has provided both characters with a long tunic: this addition, along with the monumental arch framing the two figures, contributes to dignifying them, while the arch stresses at the same time their common identity as a single constel-

26 This phenomenon, however, is not found in all manuscripts of the main recension of the *De signis caeli*: some of them simply reproduce the original set of illustrations of the 'Φ edition', without modifying the combinations of constellations. These include the following manuscripts, closely related to one another: Città del Vaticano, Biblioteca Apostolica Vaticana, ms. Vat. lat. 643 (11th century); Zwettl, Stiftsbibliothek, ms. 296 (AD 1200 ca.); Klosterneuburg, Stiftsbibliothek, ms. 685 (Klosterneuburg, 12th century). The same situation occurs in the famous manuscript of Germanicus now in Aberystwyth, National Library of Wales, ms. 735C (Limoges, AD 1000 ca.), whose text pertains to Germanicus' *O* family, but which has the set of illustrations of the Greek 'Φ edition' (Guidetti 2013, 127-37): but in this case there would have been no point in modifying the extant set of illustrations, which had originally been invented for the same text, although in a different language.

lation.[27] This identification of Gemini as Amphion and Zethus is alien to the Greek version of the 'Φ edition', and consequently to the main recension of the *De signis caeli*. On the contrary, it points directly to the tradition of Germanicus: more exactly, the detail of the two figures embracing one another comes from the tradition of the *O* family (that is, from the Latin version of the 'Φ edition'), as attested again by the Basel *codex* (fig. 15); in the manuscripts of the *Z* family, on the contrary, the two figures are separated from one another. So, the illustration of Gemini in the second recension of the *De signis caeli* was taken from the tradition of Germanicus' *O* family; but, in a way consistent with the tendency we have already seen, the combination of Gemini and Cancer in the same illustration, which is found in both the Greek and Latin 'Φ edition', has been avoided by the illustrator of the star catalogue, and the two constellations have been clearly separated into two independent entries.

The influence of the Latin version of the 'Φ edition' is detectable in other images, too: as my last example, I will turn to the constellation of Auriga. The Greek version of the 'Φ edition' depicts Auriga as a floating figure dressed as a late Roman charioteer, wearing a long tunic held by a broad belt, with a helmet on his head and the whip in his right hand; the individual stars Capella and Haedi are represented by the goats on the right: Capella at Auriga's feet, the two Haedi on his stretched left arm[28] (Paris, Bibliothèque Nationale de France, ms. Latin 5543, fol. 159*r*). In the Latin version of Germanicus' *O* family, on the contrary, Auriga is not floating in the air, but standing on board his war chariot; the figure is definitely interpreted as a soldier, dressed with a mantle leaving his upper body naked, and provided with a shield and a helmet with crest. These warlike attributes are also found in the manuscripts of the second recension of the *De signis caeli*, which, for this constellation too, must have borrowed an image taken from the tradition of Germanicus. What makes the case of Auriga particularly interesting is the fact that, in this case, the illustrations found in the two branches of Germanicus' *O* family differ considerably from one another: probably as a consequence of some damage which affected their common model, making it hardly readable and thus forcing the scribes to integrate the source through their own creativity, the two

27 It is not by chance, I think, that the monumental arcade which frames the image of Gemini in the Venice manuscript features the same colours which are found throughout late Roman astronomical illustrations: the artist probably knew that, in the most lavishly illustrated astronomical books, the images of constellations were drawn on a blue background delimited by a thick red frame, and decided to introduce a variation on its model by imitating this special layout.

28 In the Byzantine manuscript Vat. gr. 1087, fol. 307*v* Auriga is clearly identified as the Sun, as can be recognised thanks to the radiate crown; in the western tradition of the Greek 'Φ edition', on the contrary, due to the lack of that attribute, Auriga is simply identifiable as a standard late antique charioteer.

branches have undergone different kinds of simplifications. In the northern (Frankish) branch, attested by the Basel manuscript, Auriga holds a patera in the right hand and turns his head backwards towards Capella and the Haedi; his chariot is unusually drawn by a single horse[29] (fig. 16). The illustration from the southern (Italian) branch, whose earliest witness is an early-12th century Cassinese *codex* now in Madrid,[30] seems at first sight more coherent, because it preserves the usual *quadriga* and places a spear in Auriga's right hand; but here the posture appears somewhat simplified: Auriga does not turn his head backwards, because Capella and the Haedi are placed, respectively, on his shoulder and his extended left arm (fol. 59*r*).

Let us now turn to the manuscripts of the second recension of the *De signis caeli*. The image of Auriga in the Venice manuscript (fig. 17) seems at first related to the southern branch of Germanicus' *O* family: Auriga has more than one horse (actually three), he holds a spear in his right hand, and looks straight ahead. But, if we look at the same illustration in the earliest manuscript of this group, namely the Padua one, we find that here, too, Auriga was originally turning his head backwards, as in the illustrations of the northern branch (fig. 18): this detail, which is a *lectio difficilior* if compared with the more banal posture of the Venice manuscript, also appears in all the other manuscripts of this group. Thus, the image of Auriga in the second recension of the *De signis caeli* seems to combine features pertaining to both branches of Germanicus' *O* family: the *quadriga* and the spear found in the illustrations of the southern branch, together with the peculiar posture of the northern branch. This leads to the conclusion that the contamination of iconographic motifs taken from the tradition of Germanicus into the alternative recension of the *De signis caeli* could have taken place at a moment when Germanicus' *O* family was not yet split into the two branches which are now extant. Indeed, the witness of this group of manuscripts of the *De signis caeli* can help us reconstruct the original illustration of the Latin 'Φ edition', which was later simplified in different ways in the two branches of its tradition: Auriga was probably depicted with a chariot drawn by four horses (still preserved in the manuscripts of the southern branch, reduced to three in the second recension of the *De signis caeli*, reduced to one in the Basel *codex*); he had a spear in his right hand (still preserved in all manuscripts except for the one in Basel); his head was turned backwards (a detail shared by the Basel *codex* and

29 This oddity was already noticed by some early reader, who wrote next to the single horse: "iiii aequi [*sic*] debent esse".

30 Madrid, Biblioteca Nacional de España, ms. 19. Cf. Borst 2006, 1, 247-48; Blume, Haffner, Metzger 2012, 1, 102-08 and 346-53, cat. no. 32 (with further bibliographical references). The manuscript is fully digitised in the website of the *Biblioteca Digital Hispánica*, under the signature Mss/19.

the second recension of the *De signis caeli*). The manuscripts of the star catalogue, on the contrary, are of no help when it comes to reconstructing the original position of Capella and Haedi (either behind Auriga, or on his shoulder and stretched arm), since these details have been excised by the illustrators of the *De signis caeli*: as the logical consequence of the tendency, which we have already noticed, to treat every constellation as a single entry, not only the combinations of more constellations, but also the depictions of specific stars within a constellation, such as Capella and Haedi, have been expunged.

While looking forward to expanding the analysis, in a future, more detailed study, to all the images of constellations attested in this group of manuscripts, I think that these examples can already point towards some preliminary results. The Venetian manuscript Lat. VIII 22 (2760) belongs to a figurative recension of the stellar catalogue *De signis caeli* which was developed as a more scientific alternative to the standard set of illustrations found in the late Roman archetype of this tradition. The inventor(s) of this recension consciously decided to eliminate all the combinations of constellations, well attested in the ancient Aratean tradition, in order to obtain a clearer picture of the sky, in which each constellation was easily recognisable in its individual character. In this recension, in other words, the interest of the illustrator lay not in the spatial relationships between two or more constellations, as was the rule in Aratus' *Phaenomena* and its Latin translations, but rather in the appearance of each specific constellation. This attitude is very consistent with the purpose for which the stellar catalogue had been excerpted from the tradition of the *Aratus Latinus*, and it appears to be the logical consequence of a process that had already begun in some copies of the main recension of the *De signis caeli*, where some constellations (the Bears, Scorpius, Cancer) are duplicated in order to give every entry of the catalogue an illustration on its own. Given the internal coherence between the textual excerpts of the *De signis caeli* and this set of illustrations, I would propose a date for the invention of the latter not much later than the redaction of the star catalogue: that is, at the end of the 8th or the beginning of the 9th century. This early date is supported, in my opinion, by two arguments. First, the same tendency is shown in the other Carolingian star catalogue, the *De ordine ac positione stellarum in signis*, which has as *terminus ante quem* the publication of the *Libri computi* (AD 809). Second, some iconographies of the new set of illustrations are borrowed from the Latin version of the 'Φ edition', that is, from the *O* family of Germanicus' *Aratea*: as shown by the case of Auriga, these images entered the tradition of the *De signis caeli* at a moment when they had not yet been simplified as a consequence of the division of Germanicus' *O* family into two sub-groups. This means that the inventor of our set of illustrations lived in a period quite close to the common archetype of the two branches of the *O* family, or at least he had access to

an earlier copy of it, preceding the splitting of that tradition: in this sense, the earliest witness of this division, namely the Basel *codex* produced in the 820s, may constitute another *terminus ante quem*.

Despite their provenance from a different geographical and cultural background, the two manuscripts of the *De signis caeli* now preserved in Venice and Padua can shed light on a pivotal moment in the history of Western science: their set of illustrations testifies to the freedom and the creativity with which Carolingian scholars copied and contaminated their ancient models, trying to exploit them at best in order to fulfil their own scientific and computistical interests. These first generations of Carolingian scholars did not restrict themselves to merely copying and spreading ancient astronomical knowledge: they creatively manipulated all the materials available to them, with the aim of producing new scientific tools. The extent of their success can be appreciated precisely thanks to late manuscripts such as the one preserved in the Biblioteca Nazionale Marciana: some 400 years after its redaction, the star catalogue *De signis caeli* and its set of illustrations, carefully built out of the best ancient models available at the time, were still being copied and used for the study and the teaching of astronomy.

Bibliography

Abate, Giuseppe; Luisetto, Giovanni (1975). *Codici e manoscritti della Biblioteca Antoniana, col catalogo delle miniature a cura di François Avril, Francesca d'Arcais e Giordana Mariani Canova*. 2 voll. Vicenza: Neri Pozza. Fonti e studi per la storia del Santo a Padova. Fonti 1.

Blume, Dieter; Haffner, Mechthild; Metzger, Wilhelm (2012). *Sternbilder des Mittelalters. Der gemalte Himmel zwischen Wissenschaft und Phantasie, I: 800-1200*. 2 vols. Berlin: Akademie-Verlag.

Borgnet, Auguste (ed.) (1890-1899). *Beati Alberti Magni, Ratisbonensis episcopi, Ordinis Praedicatorum Opera omnia*. 38 voll. Parisiis: apud Ludovicum Vivès.

Borst, Arno (Hrsg.) (2006). *Schriften zur Komputistik im Frankenreich von 721 bis 818*. 3 Bd. Hannover: Hahnsche Buchhandlung. Monumenta Germaniae Historica: Quellen zur Geistesgeschichte des Mittelalters 21.

Ciccuto, Marcello (2003). "Michele Scoto e la *naturalis philosophia* di Dante". *Tenzone*, 4, 31-41.

Dell'Era, Antonio (1974). *Una 'caeli descriptio' d'età carolingia.* Palermo: Tipografia S. Pio X. Quaderni della Facoltà di magistero dell'Università di Palermo. Serie di filologia latina 2.

Dell'Era, Antonio (1979a). "Gli *Scholia Basileensia* a Germanico". *Atti della Accademia Nazionale dei Lincei. Memorie. Classe di Scienze morali, storiche e filosofiche*, sr. VIII, 23, 299-380.

Dell'Era, Antonio (1979b). "Una rielaborazione dell'Arato latino". *Studi Medievali*, sr. III, 20, 269-301.

Dell'Era, Antonio (1979c). "Una miscellanea astronomica medievale: gli *Scholia Strozziana* a Germanico". *Atti della Accademia Nazionale dei Lincei. Memorie. Classe di Scienze morali, storiche e filosofiche,* sr. VIII, 23, 145-268.

Draelants, Isabelle (2017). "Cinq diagrammes musicaux inédits dans le manuscrit Venezia, Bibl. Marciana, lat. VIII. 22 (2760)". *Cahiers de Recherches Médiévales et Humanistes*, 33, 27-43.

Draelants, Isabelle (forthcoming). "Le *Liber Nemroth De astronomia*: État de la question et nouveaux indices". *Revue d'histoire des textes*, 13.

Dronke, Peter (1986). *Dante and Medieval Latin Traditions*. Cambridge: Cambridge University Press.

Duits, Rembrandt (2005). "Celestial Transmissions. An Iconographical Classification of Constellation Cycles in Manuscripts (8th-15th centuries)". *Scriptorium*, 59, 147-202.

Farsetti, Tommaso Giuseppe; Morelli, Jacopo (1771). *Biblioteca manoscritta di Tommaso Giuseppe Farsetti patrizio veneto, e balì del Sagr'Ordine Gerosolimitano*. Venezia: Stamperia Fenzo.

Gebner, Gundula (2008). "Der Liber Nemroth, die Fragen Friedrichs II. an Michael Scotus und die Redaktionen des *Liber particularis*". Gebner, Gundula; Fried, Johannes (Hrsg.), *Kulturtransfer und Hofgesellschaft im Mittelalter. Wissenskultur am sizilianischen und kastilischen Hof im 13. Jahrhundert*. Berlin: De Gruyter, 285-98. Wissenskultur und gesellschaftlicher Wandel 15.

Guidetti, Fabio (2013). "L'apparato iconografico del codice Vat. gr. 1087. Per la ricostruzione dell'edizione tardoantica del *corpus* arateo". Guidetti, Santoni 2013, 113-52.

Guidetti, Fabio; Santoni, Anna (a cura di) (2013). *Antiche stelle a Bisanzio. Il codice Vat. gr. 1087 = Atti della I Giornata di studi del Gruppo di ricerca sui Manoscritti astronomici illustrati* (Pisa, Scuola Normale Superiore, 8 febbraio 2012). Pisa: Edizioni della Normale. Seminari e Convegni 32.

Haskins, Charles Homer (1924). *Studies in the History of Mediaeval Science*. Cambridge (MA): Harvard University Press. Harvard Historical Studies 27.

Juste, David (2004). "On the Date of the *Liber Nemroth*". *Journal of the Warburg and Courtauld Institutes*, 67, 255-58.

La Rocca, Cristina (1995). *Pacifico di Verona. Il passato carolingio nella costruzione della memoria urbana*. Roma: Istituto Storico Italiano per il Medio Evo. Nuovi studi storici 31.

La Rocca, Cristina (1996). "Le molte vite di Pacifico di Verona, arcidiacono carolingio". Artifoni, Enrico; Torre, Angelo (a cura di), *Erudizione*

e fonti. Storiografie della rivendicazione. Bologna: il Mulino, 519-47. Quaderni storici 31.

La Rocca, Cristina (2000). "A Man for All Seasons. Pacificus of Verona and the Creation of a Local Carolingian Past". Hen, Yitzhak; Innes, Matthew (eds.), *The Uses of the Past in the Early Middle Ages*. Cambridge: Cambridge University Press, 250-77.

Le Bourdellès, Hubert (1985). *L'Aratus Latinus. Étude sur la culture et la langue latines dans le Nord de la France au VIIIe siècle*. Lille: Université de Lille.

Lemay, Richard (1963). "Le Nemrod de l''Enfer' de Dante et le 'Liber Nemroth'". *Studi danteschi*, 40, 57-128.

Lemay, Richard (1965). "Mythologie païenne et Révélation chrétienne éclairant la destinée humaine chez Dante: le cas des Géants". *Dante et le mythes: tradition et renovation*. Paris: Librairie Marcel Didier, 237-79.

Livesey, Steven J.; Rouse, Richard H. (1981). "Nimrod the Astronomer". *Traditio*, 37, 203-66.

Marchi, Gian Paolo (2002). "Per un restauro della biografia di Pacifico, *humilis levita Christi*". Waltz, Dorothea (ed.), *Scripturus vitam: Lateinische Biographie von der Antike bis in die Gegenwart. Festgabe für Walter Berschin zum 65. Geburtstag*. Heidelberg: Mattes Verlag, 379-92.

Martin, Jean (1956). *Histoire du texte des Phénomènes d'Aratos*. Paris: Klincksieck. Études et commentaires 22.

McGurk, Patrick (1966). "Catalogue of Astrological and Mythological Illuminated Manuscripts of the Latin Middle Ages", 4, *Astrological Manuscripts in Italian Libraries (other Than Rome)*. London: The Warburg Institute.

Nardi, Bruno (1966). *Saggi e note di critica dantesca*. Milano; Napoli: Ricciardi.

Obrist, Barbara (1994). "Les Vents dans l''Astronomie de Nemrot'". Jasniewicz, Gérard (éd.), *Astronomie et sciences humaines*, vol. 10. Strasbourg: Observatoire astronomique de Strasbourg, 57-76.

Obrist, Barbara (1997). "Wind Diagrams and Medieval Cosmology". *Speculum*, 72, 33-84.

Obrist, Barbara (2011). "Measuring the Location of the World's Center in Nemroth, *Liber de astronomia*". Paravicini Bagliani, Agostino (a cura di), *La misura*. Firenze: SISMEL - Edizioni del Galluzzo, 89-111. Micrologus 19.

Ó Cróinín, Dáibhí (2010). "The Continuity of the Irish Computistical Tradition". *Computus and its Cultural Context in the Latin West, AD 300-1200 = Proceedings of the 1st International Conference on the Science of Computus in Ireland and Europe* (Galway, 14-16 July, 2006). Turnhout: Brepols, 324-47. Studia Traditionis Theologiae 5.

PLAC (1880-1923). *Poetae Latini Aevi Carolini*. 4 voll. Berolini: apud Weidmannos. Poetarum Latinorum Medii Aevi 1-4.

Preto, Paolo (1995). “Farsetti, Tommaso Giuseppe”. *Dizionario biografico degli Italiani*, vol. 45. Roma: Istituto della Enciclopedia Italiana, 184-86.

Stella, Francesco (2014). “Poesie computistiche e meraviglie astronomiche: sull’‘horologium nocturnum’ di Pacifico”. Mosetti Casaretto, Francesco; Ciocca, Roberta (a cura di), *Mirabilia. Gli effetti speciali nelle letterature del Medioevo = Atti delle IV Giornate Internazionali Interdisciplinari di Studio sul Medioevo* (Torino, 10-12 Aprile 2013). Alessandria: Edizioni dell’Orso, 181-206. Ricerche Intermedievali 7.

Toniolo, Federica (2004). “Civiltà medievale e memoria dell’antico: le *imagines* dello Pseudo Beda della Biblioteca Antoniana di Padova, ms. 27”. Quintavalle, Arturo Carlo (a cura di), *Medioevo: il tempo degli antichi = Atti del Convegno internazionale di studi* (Parma, 24-28 settembre 2003). Milano: Electa, 232-42.

Valtorta, Benedetta (2006). *Clavis scriptorum Latinorum medii aevi. Auctores Italiae (700-1000)*, sr. 1, 10. Firenze: SISMEL - Edizioni del Galluzzo. Edizione nazionale dei testi mediolatini 17.

van de Vyver, André (1936). “Les plus anciennes Traductions latines médiévales (Xe-XIe siècles) de Traités d’Astronomie et d’Astrologie”. *Osiris*, 1, 658-91.

Wiesenbach, Joachim (1993). “Pacificus von Verona als Erfinder einer Sternenuhr”. Butzer, Paul Leo; Lohrmann, Dietrich (eds.), *Science in Western and Eastern Civilization in Carolingian Times*. Basel; Boston; Berlin: Birkhäuser, 229-50.

Wiesenbach, Joachim (1994). “Der Mönch mit dem Sehrohr. Die Bedeutung der *Miniatur Codex Sangallensis 18, p. 45”. Schweizerische* Zeitschrift für Geschichte, 44, 367-88.