

The curious History  
of the Text and Illustrations  
of Hyginus's  
*De astronomia*

by  
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In Venice, on 14 October 1482, Erhardt Ratdolt published the first fully-illustrated edition of an astronomical textbook. It bore the title of the *Poeticon Astronomicum* and was attributed to the ‘most renowned man, Hyginus’.<sup>1</sup> The volume was both timely and beautifully-produced – as can be seen from the facsimile edition that accompanies this essay – and it became an immense success. Ratdolt himself went on to publish a second edition of the work in Venice in January 1485,<sup>2</sup> and he re-used the blocks depicting the constellations and the planet-gods for the illustrations in a German-language work entitled *Von den zwölf zaichen*, which was published in Augsburg in 1491.<sup>3</sup> Other printers and publishers also took advantage of Ratdolt’s success and versions of the text and its illustrations appeared in an additional twelve publications printed in Venice, Pavia and Paris within a span of just over 35 years.<sup>4</sup>

- <sup>1</sup> The title page reads: *Clarissimi Viri Iginij Poeticon Astronomicum Opus utilissimu[m] Foeliciter Incipit. De Mundi [et] sphaerae ac utriusq[ue] partiu[m] declaration[n]e.* The colophon reads: *Hoc Augustensis ratdolt germanus Erhardus. [...] Anno salutis. 1482. Pridie Idus. Octobris. Venetiis.* For a fuller description, see HAIN \*9062; GW n0374; ISTC ih00560000; USTC 994236.
- <sup>2</sup> **CLARISSIMI VIRI HYGINII POETICON ASTRONOMICON. OPUS UTILISSIMUM FOELICITER INCIPIIT.** De Mundi & sphaere ac utriusq[ue] p[ar]tiu[m] declaratione. // Anno salutifere incarnationis Millesimo quadringentesimo octogesimo quinto mensis Ianuarii die vigesima secunda. Impressum est presens opusculu[m] per Erhardu[m] Ratdolt de Augusta. Venetiis. See HAIN \*9063; GW n0375; ISTC ih00561000; USTC 994235.
- <sup>3</sup> *Hyginus von den .xij. zaich[en] und xxxij. bildern des hymels mit yedes stern. Auch die natur v[o]n eygenschaft der menschen so die darunter geborn werden. Und was in ein yeden .xij. zaichen zethun [= for 'zu tun'] oder ze lassen ist so der mond darinn ist. Auch von der eygenschaft der siben planeten. // Gegen zu augsburg am achten tag des Merzen jm.lxxxxj.jar. Gedruckt zum Augspurg durch Erhart ratdolt in dem .lxxxxj jare.* See HAIN 9067 (as Hyginus); GW n0376 (as pseudo-Hyginus); ISTC ih000563000 (as Hyginus); USTC 745887 (as Hyginus). Although the text is credited to Hyginus on the title page, it is actually taken from a German translation of the work of the 12th-century astrologer, Michael Scot.
- <sup>4</sup> For a discussion of these later volumes, see LIPPINCOTT 2017, especially pp. 232-238 and Appendix I, pp. 242-52.



Looking at the 1482 edition today, it seems a very straight-forward and uncomplicated publication. The humanist typeface is elegant and legible, and the illustrations are well-placed on the appropriate pages. Behind this model of clarity, however, is a long story with a murky beginning and a series of twists and turns, losses and rediscoveries, approximations and substitutions, and a completely unexpected conclusion.

### Hyginus and his textbook

The first uncertainty is the title of the work. Throughout its long history, the text has been called many things, including *De astronomia*, *De astrologia*, *De ratione sphaerae*, *De sphaera mundi*, *De imaginibus* (or *signis*) *stellarum* (or *caeli*) and, the preferred title in early printed editions of the work, *Poeticon astronomicum libri IV*.<sup>5</sup> For the purposes of this essay, I have used the title of *De astronomia*, feeling that the associations with poetry and the intimations of a Greek heritage (though interesting in itself, as can be seen below) are slightly misleading.

The second uncertainty is the author of the work. For, even though it has always appeared with the attribution to a Latin author bearing the name of Hyginus, the exact identity of its author has been the subject of controversy for centuries.<sup>6</sup> The most likely candidate, however, seems to be C. Iulius Hyginus, the Keeper of the Palatine Library during the reign of Augustus Caesar and friend of the poet, Ovid.<sup>7</sup> This identification helps to place the work chronologically between Cicero's Latin translation of Aratus's *Phaenomena* (89-86 BC) and the much more ambitious and scholarly Latin translation (or, in some cases, adaptation) of the same poem attributed to Germanicus Caesar (16-17 AD).

Hyginus's intent seems to have been very different from that of his compatriots, however. One might be romanticising, but whereas it appears to have been appropriate for aspiring politicians and young emperors-to-be to prove their talents by reforming a well-known Greek classic into the modern idiom of Latin, the 'humble librarian' set himself a very different kind of task. Obviously, any introduction to the workings of the heavens written at the time would be construct-

<sup>5</sup> The idea of a 'poetical astronomy' is certainly a nod to Aratus, albeit a misplaced one. For a discussion of the name *De Astronomia* for the treatise, see LE BŒUFFLE 1983, pp. lxxii-lxxiii. Note that Le Bœuffle himself believes that *De sphaera* is the most appropriate title for the work, but feels 'resigned' to use the imperfect title of *De astronomia* to mesh better with his philological predecessors (p. lxxiii).

<sup>6</sup> A convenient resumé of the state of the question can be found in LE BŒUFFLE 1983, pp. xxxi-xxxviii. VIRÉ 1981 provides a list of the 88 manuscripts of the text pre-dating the 16th century that she was able to trace. A few more examples can be added to this list, as well as some minor corrections made as to whether a particular manuscript is illustrated or not.

<sup>7</sup> For a summary of the relative strengths and weaknesses of this identification, see LE BŒUFFLE 1983, pp. xxxi-xlvi and PIACENTE 1988, pp. vii-xi.

ed with the *Phaenomena* of Aratus in mind – the poem certainly being the most widely-read work on the topic of across the Hellenised Mediterranean; but it is important to recognise that *De astronomia* is not simply a convenient 'companion piece' or prose apparatus to the poem, as the later series of excerpts and so-called 'scholia' connected with the *Aratus latinus* and its various revisions are. Instead, it is a largely self-contained work, with its own coherent internal structure and carefully maintained focus.

There are several passages in the text in which Hyginus outlines his intent and his method. He describes his treatise as 'a kind of rough sketch of a scientific work' that is intended 'not to teach those who do not know the subject, but to rekindle the memories of those who are already knowledgeable'.<sup>8</sup> The amount and range of scholarly and, what one might loosely call, 'scientific' material that was available to an author writing at the turn of the Roman millennium was far wider and more varied than would have been available to Aratus, who was composing his poem nearly three centuries earlier. And, to a certain extent, Hyginus does see it as one of his tasks to offer clearer explanations of the celestial sphere than Aratus had done – not only because he believes that Aratus's descriptions are 'somewhat obscure', but also because he wishes to examine these issues more deeply.<sup>9</sup> To this end, he composes a treatise that focusses on four main topics: 1) an introduction to the sphere of the heavens and the terminology he will be using; 2) an exploration of the various myths surrounding each constellation; 3) a description of where each constellation is located in the heavens and a list of the positions of the stars within each figure; and 4) a discussion of the celestial Circles, the markers for the risings and settings of the different constellations, an overview of the paths of the Sun and the Moon and a quick summary of the five planets.

<sup>8</sup> Hyginus, *De Astronomia*, I, preface: ... *hoc velut rudimento scientiae nisus scripsi ad te, non ut imperito monstrans, sed ut scientissimum commoneans* ('I rely on a sort of rough sketch of a scholarly work for you, not to teach those who do not know the subject, but to rekindle the memories of those who are already most knowledgeable'). See LE BŒUFFLE 1983, p. 6 and VIRÉ 1992, p. 1.

<sup>9</sup> Hyginus, *De Astronomia*, preface: *Etenim praeter nostram scriptionem sphaerae quae fuerunt ab Arato obscurius dicta, persecuti planius ostendimus, ut penitus id quod coepimus exquisisse videremur* ('Because, beyond a proper description of the sphere, I am bound to explain more clearly some of the obscurities in the explanations made by Aratus, so that it is apparent that I have taken no small pains in pursuing this subject'). See LE BŒUFFLE 1983, p. 4 and VIRÉ 1992, p. 4.

In Book IV, he repeats the claim that Aratus has not provided either sufficient or sufficiently clear information, and that his own explanations will be more comprehensible. See Hyginus, *De Astronomia*, IV, 1: ... *sed quoniam Aratus quattuor circulis sphaeram plurimum valere dicit neque eorum aperte quemquam demonstrat, voluntatem apertius ostendimus ...* ('For while Aratus attributes a preponderant role to the four circles of the sphere, without describing any of them clearly, we will express our thought more clearly ...'). See LE BŒUFFLE 1983, p. 114 and VIRÉ 1992, p. 125.



### The sources of the text of *De astronomia*

To achieve his aim, Hyginus follows two paths. First, as would befit his putative role as a librarian, Hyginus brings together material from various different sources in order to compare, explain, amplify or correct the original Greek poem by Aratus.<sup>10</sup> As Hyginus sees it, his research has been fairly extensive, if not, indeed, exhaustive.<sup>11</sup>

Amongst Greek sources, his debt to Eratosthenes is clear – citing his work 21 times, with ample evidence of additional, uncredited use elsewhere.<sup>12</sup> Hyginus's dependence on Eratosthenes for both his catasterismic myths and for much of the data in his star catalogue has long been noted, but few have drawn attention to their similar vocations – Eratosthenes being the Keeper of the great Library of Alexandria – which might have led both authors towards wanting to help the educated reader, and concluding that the best way to do this was to make an accessible compilation of all the available resources.

There are numerous further hints of influence from earlier Greek and later Hellenistic sources.<sup>13</sup> By way of record, Bunte counted 40 Greek authors cited by Hyginus.<sup>14</sup> Hyginus is also intimately acquainted with Latin authors. He mentions Cicero twice by name and there are numerous other discernible, but uncredited, borrowings from him throughout the *De Astronomia*.<sup>15</sup> It is also worth noting Le Bœuffle's suggestion that Hyginus's understanding of the Aratean poem may have

<sup>10</sup> The most convenient and comprehensive discussion of Hyginus's sources appears in LE BŒUFFLE 1983, pp. ix-xxiii, but see also the comparisons between Eratosthenes and Hyginus in ZUCKER 2015 (esp. Appendix 1) and between the author of the so-called '*scholia Basilensia*' and Hyginus in LIPPINCOTT 2019a.

<sup>11</sup> Hyginus, *De Astronomia*, IV, 14: *Praeterea cum reliqua omnia diligentissime persecuti fuerimus, alienum videtur esse nos non eandem persequi causam* ('Moreover, after having pursued the rest with the greatest diligence, it seems incongruous no to persevere with the same motivation'). See LE BŒUFFLE 1983, p. 138 and VIRÉ 1992, p. 149 (reading *eandem*).

<sup>12</sup> See MARTIN 1956, esp. pp. 95-102 and LE BŒUFFLE 1983, pp. xv- xvi. Zucker believes that Hyginus's debt to Eratosthenes has been underestimated, suggesting that most of the Greek authors that Hyginus cites, the overall structure of the *De astronomia* (including the contents of Book I and IV), his claim to have consulted astronomical instruments and even a few of his rhetorical devices and asides are all drawn either directly from Eratosthenes or the Alexandrine compilation containing an early version of the *Catasterisms*. See ZUCKER 2015 (and via personal communication, March 2021).

<sup>13</sup> Most intriguingly, though, evidence that Hyginus consulted Hipparchus directly is slim. For, whereas Germanicus certainly corrected a number of the astronomical 'mistakes' in Aratus's text that had been criticized by Hipparchus, Hyginus tends to repeat the errors somewhat, as Le Bœuffle says, '*docilement*'. Also, he does not cite his near-contemporary Geminus, whose introductory Greek treatise on the mathematics of the sphere was certainly circulating in Rome at the time. See LE BŒUFFLE 1983, pp. xv- xvi.

been aided by a Latin intermediary. This might have been a now-lost Classical version of the Latin *Aratea*;<sup>16</sup> but one likely influence and possible source for much of Hyginus's material could have been the work of Nigidius Figulus, whose *De Sphaera* is known today only through a relatively small number of fragments.<sup>17</sup> As with Hyginus, Nigidius seems to have been profoundly influenced by the works attributed to Eratosthenes and seems especially interested and knowledgeable concerning the writings of earlier Greek authors.<sup>18</sup>

In addition to his search through the best written sources – his *optimi auctores*<sup>19</sup> – the second path Hyginus used to create a more comprehensible treatise was an empirical one.<sup>20</sup> Le Bœuffle was the first scholar to comment upon the fact that, when Hyginus refers to the celestial sphere (*sphaera*), he often seems not to be describing observed celestial phenomena, but, rather, referring the reader to an astronomical model. For his introductory explanation of the celestial circles, Hyginus could have used an armillary sphere; but, for his discussions on the inter-relationships between the constellations and, especially, between the constellations and the celestial circles, it is most likely that Hyginus used a celestial globe as his model.<sup>21</sup> Indeed, Hyginus twice tells us when the use of a celestial globe is essential to understanding the 'mechanics' of the heavens. First, he explicitly states a celestial globe is an essential tool for understanding the phenomena of day and the night in Book IV, 9: ... *sed aliter esse ex ipsa sphaera intellegere licebit* ('... for it is from the [use of

<sup>14</sup> See BUNTE 1875, pp. 3-6; ZUCKER 2015, p. 91, n. 25 and LIPPINCOTT 2019a, pp. 318-38.

<sup>15</sup> See LE BŒUFFLE 1983, p. xvi.

<sup>16</sup> See LE BŒUFFLE 1983, p. xvii.

<sup>17</sup> See SWOBODA 1889/1964 and DELLA CASA 1962.

<sup>18</sup> See MARTIN 1956, p. 124 and LE BŒUFFLE 1983, pp. xvii-xxi (who suggests a number of textual and intellectual parallels between the two authors). Against this, however, Zucker has expressed doubts that Hyginus consulted his works for, at least, the contents of Book II and III of *De astronomia*. See ZUCKER 2015, p. 93.

<sup>19</sup> Hyginus, *De Astronomia*, preface I, 6. See LE BŒUFFLE 1983, p. 4 and VIRÉ 1992, p. 4.

<sup>20</sup> The following section has benefitted greatly from conversations with Elly Dekker, which took place prior to her publication of *Illustrating the Phaenomena. Celestial Cartography in Antiquity and the Middle Ages* in 2013. For the culmination of her published thoughts on Hyginus's globe, see DEKKER 2013, pp. 80-84

<sup>21</sup> See LE BŒUFFLE 1983, pp. ix-xii. Le Bœuffle went so far as to argue that Hyginus's text was specifically intended as manual on the use of a globe (*ibid.*, p. ix).

the] sphere itself that you will be able to understand the difference').<sup>22</sup> Further, he tells us that, without a globe, it would be impossible to understand the risings and settings of the signs throughout the year: *Sed ne in dubium veniat [...], quid de reliquis signis sine sphaera possit intellegi, sic inveniatur* ('but it should not be in doubt, [...] that one might be able to understand the rest of the signs without a sphere, as will be discovered').<sup>23</sup>

Hyginus was certainly not the first author to advocate the usage of celestial models. The early interest in σφαιρικὸς λόγος ('the doctrine of the sphere') is clear from the two early treatises by Autolycos (fl. ca. 300 BC), *On the moving sphere* and *On risings and settings*, in which characteristics of phenomena, such as risings and settings, are explained in terms of the mathematical properties of the moving sphere.<sup>24</sup> A number of modern scholars have suggested that this implies that celestial globes were actually used as scientific instruments as early as the 4th century BC,<sup>25</sup> but the clearest advocacy for the scientific use of celestial models does not appear until a century later in Archimedes's letter to Eratosthenes, where he suggests that such devices provide a useful tool both for conceptualising and testing astronomical problems.<sup>26</sup> The use of celestial models specifically as an aid to teaching or explaining astronomical principles and phenomena – the kind of activity in which Hyginus is specifically engaged – appears to be a much later development, however. For example, Geminus, in his *Introduction to the Phaenomena* (a work that is nearly contemporary with Hyginus's own), explicitly describes two types

<sup>22</sup> Hyginus, *De Astronomia*, IV, 9. See LE BŒUFFLE 1983, p. 126 and VIRÉ 1992, p. 137.

<sup>23</sup> Hyginus, *De Astronomia*, IV, 10, 2. See LE BŒUFFLE 1983, p. 127 and VIRÉ 1992, p. 138.

<sup>24</sup> See AUJAC 1979. See also HUXLEY in *DSB*, 1981, II, pp. 338-9.

<sup>25</sup> See, for example, METTE 1936; BÖKER 1952; AUJAC 1970, pp. 93-107; and LE BŒUFFLE 1983, pp. x-xi. Amongst the Greek authors, Le Bœuffle cites Autolycos, Euclid, Hypsicles and Archimedes. Some historians have argued that Hipparchus actually used a globe (see NADAL and BRUNET 1983-84, pp. 201-236). Le Bœuffle, however, argues that it was the Romans in particular – 'avec leur esprit pratique' – who demonstrated a marked fascination for the instrument; and he mentions Cicero's admiration for the 'planétaires' of Archimedes and Posidonius. See LE BŒUFFLE 1983, pp. x - xi, esp. p. x, n. 4 and p. xi, n. 1.

<sup>26</sup> For the letter of Archimedes, see MUGLER 1970-72, III (1971), p. 84; and for Geminus, see AUJAC 1975, pp. lxx-lxxii.

of globe: a solid one with the constellations delineated and a 'ringed' one.<sup>27</sup> In particular, he mentions the doctrine of the sphere when discussing topics relating to the rising and setting of the stars and the inequality of day and night throughout the year – two phenomena also singled out by Hyginus – as well as for describing the movement of the planets and to explain why one cannot trace a 'local horizon' on a mobile sphere.<sup>28</sup>

### The structure of *De astronomia*

As mentioned, the clearest indication that Hyginus's primary aim was not to create a simple commentary or an updated 'scholars's crib' for the *Phaenomena* is the way in which he has structured his treatise. The division of *De astronomia* into four separate Books with two independent prefaces is a modern editorial invention, but Hyginus sets out his work in such a clear and concise manner that the practice seems fully warranted, as does the sub-division of each of the four Books into very clearly delineated chapters.<sup>29</sup> The incipits and explicits of each Book are as follows:

Book I, preface *Hyginus. M. Fabio plurimam salutem. Et si te studio grammaticae artis inductum non solum versuum moderatione — et intium rerum demonstrabimus.*

Book I *De Mundo. Mundus appellatur is qui constat ex sole et luna — in simili causa posse constitui suspicamur.*

<sup>27</sup> See AUJAC 1975, esp. pp. lxx-lxxii, where Aujac argues that Geminus refers to at least four different types of celestial model: a sphere of the constellations (V, 65) and/or a sphere of the fixed stars (I, 23; V, 57; and XII, 14); an armillary sphere (XVI, 10-12); a simple theoretical model of the celestial circles (V, 54; VI, 23) and a planetary model.

<sup>28</sup> Geminus, *Introduction to the Phaenomena*, XIV, 9 (rising and setting of the stars); VI, 12 (day and night); V, 63 (when a horizon circle might be traced on the sphere, then – by turning the sphere – it could be moved to pass through the zenith, which is unconceivable and contrary to the theory of the sphere) and XII, 23 and 27 (movement of the planets). See AUJAC 1975, p. lxx, nn. 3 and 4.

<sup>29</sup> The only area of minor discrepancy between various versions of the text is in the division between Books III and IV (see below).



Book II, preface *Sed quoniam quae nobis de terrae positione dicenda fuerunt — ad delectationem afferent lectori.*

Book II *Igitur, ut supradiximus, initium est nobis Arctos — Nos autem omnium corporum deformationem dicere instituimus.*

Book III *Igitur incipimus a polo boreo protinus dicere — cum piscibus stellarum omnino, xii.<sup>30</sup>*

Between Books III and IV, there are a few lines which are added to the beginning of Book IV in most early manuscripts, though modern editors tend to insert these lines at the end of Book III. In the Ratdolt 1482 edition, however, these lines appear at the top of a folio, almost hovering between Books III and IV:

*Quae ad figurationem syderum pertinent, ad hunc finem nobis erunt dicta. Reliqua protinus dicemus.*

*Clarissimi viri Iginij De quinque circularum inter corporum caelestia notatione, et planetis. Liber Quartus et ultimus.*

*Quoniam initio sphaerae circuli quinque quomodo efficerentur — Annum voluerunt esse cum sol ab aestivo circulo...*

As can be seen, from the last line of this section, Book IV ends mid-sentence, part way through a discussion of the year being defined by the Sun's return to the Tropic of Cancer. It is difficult to determine when this mutilation occurred, but it certainly pre-dates the 9th century, as none of the earliest manuscripts of the text extend beyond this point.

The ways in which medieval and Renaissance scribes dealt with this problem are all relatively cautious. Nonetheless, in her study of the various explicits to Book IV, Viré counted eight main types, to which one can add two more examples often

<sup>30</sup> The Radolt 1482 edition ends Book III with: ... *autem cum Piscibus. Sed est stellarum omnino xij.*

found in 15th-century versions of the text.<sup>31</sup>

Interestingly, the Ratdolt 1482 edition ends with the variant: ... *cum sol ab aestivo circulo redit*. Τελοσ, which is no. 4 from Viré's list. This fact provides some insights into the very early history of this version of the text;<sup>32</sup> but, perhaps more relevant for the purposes of the present essay, it is worth noting that it also appears as the explicit of a manuscript that was compiled by the Florentine Humanist and statesman, Coluccio Salutati,<sup>33</sup> which — as will be discussed below — appears to have been the archetypal textual model for Ratdolt's edition.

<sup>31</sup> See VIRÉ 1981, esp. p. 184, where she lists:

1. ... *cum sol ab aestivo circulo ...*
2. ... *cum sol ab aestivo circulo rediens CCCLXV dies suo cursu transigit.*
3. ... *cum sol ab aestivo circulo descendens CCCLXV dies suo cursu transigit.*
4. ... *cum sol ab aestivo circulo redit.*
5. ... *cum sol ab aestivo circulo redeat.*
6. ... *cum sol ab aestivo circulo redeat zodiacum circum ad id signum unde incipiebat peremitur.*
7. ... *cum sol ab aestivo circulo zodiacum ad id signum unde incipiebat peremitur.*
8. and, in some manuscripts, the problematic chapter 19 is omitted all together.

Given that Viré's collation focuses mainly on those manuscripts dating from the 9th to the 12th centuries, later explicits are not mentioned. To her list, one would add two examples often found in 15th-century versions of the text:

9. ... *cum sol ab aestivo circulo descendens redit ad eundem* (such as appears in Florence, BNC, Magliabecchiana XI. 114, fol. 17r; Florence, Bibl. Laurenziana, Plut. 89. sup. 43, fol. 108r; Vatican, BAV, Urb. lat. 1358, fol. 152r and Vatican, BAV, Vat. lat. 3110, fol. 83v).
10. ... *ad eum locum ubi occidere dicatur ibi montium magnitudine* (this ragged explicit is found in another family of 15th-century manuscripts, which all end mid-sentence in the middle of Book IV, chapter 9. The source of this explicit seems to be the 12th-century French or Italian (?) manuscript, Florence, BML, Plut. 29. 30. For additional examples of this explicit, see REEVE 1983, p. 188 and VIRÉ 1981, p. 178.

<sup>32</sup> Viré locates this ending to Book IV in family of manuscripts that first appears in Northern France sometime in the 9th century. See VIRÉ 1981, pp. 165-75.

<sup>33</sup> Vatican, BAV, Vat. lat. 3110, fol. 46v, which substitutes *Amen* for Τελοσ.



### The content of *De astronomia*

In terms of content, Book I begins with the dedication to a certain 'M. Fabius'<sup>34</sup> and provides an overview of the topics the author intends to discuss. It begins with a series of definitions to establish a set of conventions upon which the later discussions of the cosmography of the universe will be based: *mundus*, *sphaera*, *centrum*, *dimensio*, *circulus*, *horizon*, *polus*, *parallelus*, *zodiacus* and *terra*. By providing these definitions, Hyginus establishes a summary introduction to the main elements of the celestial sphere and its circles, and of the Earth and its zones.

Book II is a compendium of catasterismic myths associated with 41 constellations or constellation groupings, which are organised in the following manner:

1. Ursa Maior (*Arctus maxima*)
2. Ursa Minor (*Arctus minor*)
3. Draco
4. Bootes (*Arctophylax* or *Arcas/Arcades*)
5. Corona Borealis
6. Hercules
7. Lyra
8. Cygnus
9. Cepheus
10. Cassiopeia
11. Andromeda
12. Perseus
13. Auriga (Hyginus also mentions the stars of Capra and the Haedes in his description of Auriga in Book II)
14. Ophiuchus (*Anguitenens*), with Serpens as an integral part of the constellation.
15. Sagitta
16. Aquila
17. Delphinus

<sup>34</sup> The identification of this mysterious figure remains the subject of speculation and includes the grammarian, (Fabius) Quintillian. For additional suggestions, see LE BŒUFFLE 1965, esp. p. 290 and LE BŒUFFLE 1983, pp. xxxviii-xlvi.

18. Pegasus
19. Triangulum (*Deltoton*)
20. Aries
21. Taurus (Hyginus adds the myths of the Hyades and Pleiades in the descriptions of Taurus)
22. Gemini
23. Cancer (with a description of the Aselli within this chapter)
24. Leo (with mention of the Coma Berenices in this section)
25. Virgo
26. Scorpio
27. Sagittarius (with Corona Austrinus mentioned in this section)
28. Capricorn
29. Aquarius
30. Pisces
31. Cetus
32. Eridanus (mentioning Canopus)
33. Lepus
34. Orion
35. Canis Maior (mentioning the bright star, Sirius)
36. Canis Minor (called Procyon)
37. Argo
38. Centaurus (mentioning Lupus in this section)
39. Ara
40. Hydra with Crater and Corvus
41. Piscis Austrinus (*Piscis Notius*)

Book II ends with a discussion of the mythologies associated with the five planetary gods and the Milky Way.<sup>35</sup>

In these chapters, Hyginus generally records a series of different views provided by previous writers regarding the mythological origins of each of the figures of the constellations, outlining the reasons why the gods decided that a particular figure deserved to be elevated to the eternity of stars from its mortal, earthly beginnings

<sup>35</sup> Hyginus does not mention the Ptolemaic constellation Equuleus, and Libra is mentioned as a part of the constellation of Scorpio.

– or, literally, ‘catasterised’.<sup>36</sup> He regularly cites the various authorities he has used to compile the selection of myths, and this has provided subsequent scholars with valuable evidence of the wide range of literary sources that were available at the time, including several authors whose cited works have since been lost and for whom Hyginus often proves to be a unique witness.<sup>37</sup> Sometimes, however, Hyginus merely refers to variant stories with ‘but others say’ (*nonnulli autem dicunt*) or ‘but many say’ (*sed complures dixerunt*). Usually, he lists the alternative identifications of a constellation without passing judgment; but, sometimes, he betrays a critical edge. For example, in describing the myths associated with Hercules, he dismisses the Aratean formula that ‘no one can prove who this figure is’ with the claim that ‘we’ (Hyginus tends to refer to himself in the third-person plural) ‘will try to say something approaching the truth’.<sup>38</sup> Similarly, he notes those who fall into error about the origin of the name of Phoenike;<sup>39</sup> and claims that those who refer to the constellation of Cygnus as *ornis* (‘the Bird’) are ignorant of its history.<sup>40</sup>

<sup>36</sup> The word catasterism coming from the Greek verb, καταστερίζω (‘to place among the stars’) from κατά (‘into’ or ‘towards’) and ἀστήρ (‘star’). The conventions that Hyginus uses are largely derived from Eratosthenes. For recent discussions on this topic, see SANTINI 1998; PÁMIAS/ZUCKER 2013, pp. lxxvii–lxxix; PÁMIAS 2014 and ZUCKER 2015, pp. 95–97.

<sup>37</sup> For a list of these sources, set in comparison with Eratosthenes, see ZUCKER 2015, pp. 104–19 (Appendix I). For comparisons with the *Epitome* and the *Fragmenta Vaticana* and the *scholia Basileensia*, the so-called ‘Greek *scholia*’ and the *Aratus latinus*, see LIPPINCOTT 2019a, pp. 318–38 (Appendices I and II).

<sup>38</sup> Hyginus, *De Astronomia*, II, 6: *Etsi, qui sit hic, negat Aratus quemquam posse demonstrare, tamen conabimur [demonstrare] ut aliquid verisimile dicamus* (‘Even though Aratus claims that no one can prove who he is, we will try to show nonetheless that we can say something plausible’). Ed. LE BŒUFFLE 1983, p. 31; and VIRÉ 1992, p. 29 (reading *quis sit hic* and deleting *conabimur*) and English transl HARD 2015, p. 28.

<sup>39</sup> See Hyginus, *De Astronomia*, II, 2, explaining that it is not so-named after the Phoenicians themselves, who used the constellation to navigate, but from the fact that Thales, the first astronomer to name Ursa Minor, was of Phoenician descent. Hence the appellation is in his honour. Hyginus cites Herodotus as his source. See ed. LE BŒUFFLE 1983, p. 21; and VIRÉ 1992, p. 19 and English transl HARD 2015, p. 10.

<sup>40</sup> Hyginus, *De Astronomia*, II, 8: *Hunc Cygnum [κύκνον] Graeci appellant; quem complures propter ignotam illis historiam, communi genere avium ὄρνιν appellaverunt* (‘The Greeks call this constellation *Kýknos* (the Swan), but many people, through ignorance, have called it *Ornis*, using the name that is applied to birds in general’). Ed. LE BŒUFFLE 1983, p. 36; VIRÉ 1992, p. 35 and English transl HARD 2015, p. 20.

In Book III, each constellation is described in the same order as in Book II; but, here, the emphasis is on the cartography of the figure. This includes its location relative to the surrounding constellations and to the celestial circles, often with some indications being given as to its overall shape and disposition, as well as providing information about the constellations with which each figure rises and sets. He also lists the positions of the stars on the body of the figure itself, describing the placements in terms of ‘left’ and ‘right’ and ‘above’ and ‘below’, in line with the tradition of descriptive star catalogues, such as one finds in the *Catasterisms* of Eratosthenes.<sup>41</sup>

One slightly confusing aspect of Hyginus’s descriptions of the constellations is that he does not seem always to provide consistent information across the four books. In particular, there are a number of occasions on which he appears to confuse the ‘right’ and ‘left’ side of the figures.<sup>42</sup> Le Bœuffle suggested that these transpositions can be cited as further evidence that Hyginus used a celestial globe, and not direct observation of the night sky, to construct his descriptions – a view with which Dekker concurs and augments with a series of compelling examples.<sup>43</sup>

A globe would have been most useful when it comes to recording phenomena associated with the apparent movement of the celestial spheres (such as for the phenomena of the simultaneous risings and settings of the constellations) and for mapping the relative positions of the constellations, between each other and in

<sup>41</sup> As part of the historical debate over the attribution of the *Catasterisms* to Eratosthenes, scholars have also queried whether the two parts of the text – the fables and the star descriptive catalogues – reflect a single original text or if they should be considered as independent productions, one or both of which may or may not be by Eratosthenes. For an overview of these arguments, see PÁMIAS 2016, pp. 3–13 and LIPPINCOTT 2019a, pp. 273–76. For the purposes of this essay, Eratosthenes is named as the author of both sections of the composition.

<sup>42</sup> For an in-depth examination of these idiosyncrasies, see DEKKER 2013, pp. 80–84.

<sup>43</sup> See LE BŒUFFLE 1983, pp. xi–xii and DEKKER 2013, pp. 80–84. For the differences in perceived orientation between ‘globe-view’ and ‘sky-view’ – the so-called ‘Hipparchan rule’ – see DEKKER 2013, pp. 34–38.



the night sky.<sup>44</sup> To my mind, however, it is less likely that he used a globe as the basis of his star catalogues, the main reason being that he consistently lists the positions of the stars within each constellation from the 'top' of the figure down to the 'bottom', or from the head to the feet, regardless of the actual orientation of the figure in the night sky. This is very different from the way the more mathematically-oriented astronomers, such as Hipparchus or Ptolemy, describe the constellations.<sup>45</sup> It is, however, the same method used by Eratosthenes in his descriptive star catalogue.

Given that the constellation figures on the globe are oriented in a number of different ways across its surface (following the orientation in which they are imagined in the night sky), it would have involved a great deal of manipulation of the globe to create a consistent head-to-toe order for each individual figure. Moreover, the few antique globes that have survived from Antiquity suggest that the stars were not always marked on the constellations figures; and, when they are, it is rarely a full complement of the stars for each figure, nor are the stellar markings always astronomically accurate.<sup>46</sup> Therefore, it seems more likely that Hyginus's star-lists are not the fruit of observational gymnastics, but reflect the fact that he has simply copied much of his data either from an extant star-list or, possi-

<sup>44</sup> See, for example, Macrobius's definition of the 'invisible' celestial circles in the *Commentarii in somnium Scipionis*, I, xv, 2: *Est autem lacteus unus e circulis qui ambiunt caelum: et sunt praeter eum numero decem, de quibus quae dicenda sunt proferemus, cum de hoc competens sermo processerit. Solus ex omnibus hic subiectus est oculis, ceteris circulis magis cogitatione quam visu comprehendendis* ('The Milky Circle, indeed, is only one of the circles that girdle the celestial sphere; there are besides it ten others, which will be discussed fully when the proper time comes. It is the only one of the circles that is visible to the eye, the others being apprehended in the mind and not seen'). Ed. WILLIS 1994, II, p. 61 and English transl STAHL 1952, p. 149. Stahl draws attention to a similar passage in Geminus, *Isagoge*, V, ii (STAHL 1952, p. 149, n. 1). See also AUJAC 1975, pp. 22-23 and DEKKER 2013, pp. 7-10.

<sup>45</sup> For a discussion of the development of using mathematical co-ordinates to describe celestial phenomena, see DEKKER 2013, pp. 10-14.

<sup>46</sup> The lack of examples does make any such claim highly conjectural. It is possible that a large-scale globe, such as the Farnese Atlas, may have had a full complement of stars accurately painted on its surface. If one compares the positions of the stars in the Berlin fragment, the Mainz globe or the Kugel globe, however, one can see that they are incomplete and inexact. See DEKKER 2013, pp. 52-53 (Berlin fragment); 57-69 (Kugel globe) and 69-80 (Mainz Globe).

bly, from pictures of the individual constellations that accompanied such texts.<sup>47</sup>

A comparison between the star lists in the *Catasterisms* and in Book III of *De Astronomia* suggests they belong to a shared tradition, but it is impossible to argue that Eratosthenes's text was either the primary or the only source for Hyginus's star lists.<sup>48</sup> Not finding a direct correlation between the two authors is not as serious as it might first sound, given that, during the time at which Hyginus was compiling information for his treatise, there seem to have been numerous versions and adaptations of the sort of star-lists that have survived in the *Epitome* and the *Fragmenta Vaticana*. Many of these variants bore the name of 'Eratosthenes' as their author. Therefore, when a Roman author cites the name of 'Eratosthenes' as his textual authority, he may well be referring unknowingly to a tradition comprised of a wider range of texts and images, each of which may be derived ultimately from the 3rd-century BC Alexandrian polymath, but which has endured its own minor transformations during the intervening centuries.

The inconsistencies that modern scholars have detected in *De astronomia* could be due to the fact that Hyginus had relied on one of these variant versions of 'Eratosthenes', which itself contained the discrepancies. Equally, if one takes into consideration that he may have relied not only on written star-lists, but also on information gleaned from his own perusal of a celestial globe as well as from consultation of a set of illustrations of the individual constellations, the potential for incongruities begins to rise exponentially. Viewed through this lens, it seems a marvel that there are not a greater number of slips in his transposition and rationalisation of all this disparate data.

It is impossible to say what the actual illustrations upon which Hyginus relied might have looked like. In terms of presentation, they may have existed as marginal pen-drawings running alongside the text, or in a separate, self-contained

<sup>47</sup> Jordi Pàmias and Arnaud Zucker have convincingly argued that the tradition of an illustrated star catalogue should be considered as dating back as far as Eratosthenes – if not, indeed, having been introduced as an innovation by him. See PÀMIAS/ZUCKER 2013, p. xcvi. See also the discussion in LIPPINCOTT 2019a, pp. 274-276.

<sup>48</sup> One reason for this is that the original version of Eratosthenes's text no longer survives, but exists only in the later versions, known as the *Epitome* and the *Fragmenta Vaticana*. For concordance of the star positions in the surviving texts, however, see LIPPINCOTT 2019a, pp. 338-59 (Appendix III).



papyrus<sup>49</sup> or, even, as a series of single-page figures, such as one sees preserved in the Leiden *Aratea*.<sup>50</sup> At this stage, the only thing that one can say with certainty is that the figures would have all been presented as individual figures (apart from those cases where more than one figure is included in a constellation grouping, such as Ophiuchus and Serpens, or Centaurus and Lupus), they would have been posed upright and they would have been marked with stars.<sup>51</sup>

Barring the few discrepant details, one imagines that it should be possible to provide a fairly accurate reconstruction of what the corpus of 'original Hyginian constellations' looked like from their descriptions provided in the text – much in the same way that Elly Dekker has 'recreated' a vision of the 'Hyginian globe'.<sup>52</sup> That task, however, lies beyond the confines of the present study, which – for better or worse – must focus on what later writers and artists managed to confect when faced with this conundrum.

Book IV of the *De astronomia* returns to the subject of cosmology and to astronomical topics, such as the position of the constellations on each celestial circle, the unequal division of the night and day and the risings and settings of the constellations relative to the signs of the zodiac. He discusses the movements of the Sun and the Moon and the five planets and touches upon Pythagorean notions of the harmony of the spheres. The whole work was supposed to have ended with a section on the Metonic cycle, which has been lost.<sup>53</sup>

<sup>49</sup> Perhaps along the lines of a semi-independent set of constellation illustrations, such as one sees in the much later 14th-century Byzantine manuscript Vatican, BAV, Vat. grec. 1087. The most recent and comprehensive study of this manuscript appears in GUIDETTI/SANTONI 2013.

<sup>50</sup> The seminal work to consult on the early formats of the classical texts and their commentaries and illustrations is WEITZMANN 1947/1970, pp. 40-108.

<sup>51</sup> One assumes that these figures would have been presented as facing the viewer, in the so-called 'sky view'; but, as other examples of constellation illustrations repeatedly prove, artists tend not to adhere the requirements of the 'Hipparchan rule' as consistently as many modern scholars might wish.

<sup>52</sup> See n. 20 above.

<sup>53</sup> Hyginus's intentions to speak more fully about the Metonic cycle are signalled in the preface to Book I, 5: *Diximus etiam qua ratione priores astrologi non eodem tempore signa et reliquas stellas reverti dixerint et quare Meton diligentissime observasse videatur et quid reliquos sefellierit in eadem causa* ('We have also indicated to which theory the ancient astronomers assigned different times to the return of the signs and also the planets, [and] why Meton seems to have made the most meticulous observations and what were the mistakes of other wise men made concerning same subject'). Ed. LE BŒUFFLE 1983, pp. 4 and 150, note 22) and VIRÉ 1992, p. 3. For the later attempts at resolving the incomplete end to Book IV, see p. 9, n. 31 above.

### The illustrations of *De astronomia* in medieval manuscripts

Having posited the argument that the history, the content and the language of *De astronomia* suggest a strong connection between the text and a series of pictorial images – arguably drawn from a celestial globe as well from as a series of constellation pictures – one immediately encounters a fundamental paradox when dealing with the extant manuscripts of the text. The vast majority of the earliest versions of the text are not illustrated.<sup>54</sup> So, whereas the text of the *De astronomia* appears to have been known since at least the 6th century<sup>55</sup> and reasonably popular and seemingly widely-diffused from at least the early 9th century,<sup>56</sup> and, even though the text often appeared alongside other astronomical texts which do contain illustrations of the constellations,<sup>57</sup> there are no surviving examples of an

<sup>54</sup> Working from the information supplied in Viré's catalogues (1981 and 1992), only 11 of the 39 manuscripts predating the 13th century have illustrations accompanying the Hyginus sections. See APPENDIX I for details.

<sup>55</sup> The text of *De astronomia* was known or, at least, is repeatedly cited by Isidore in *De natura rerum*. See, for example, the citations noted by KENDALL/WALLIS 2016, pp. 300-301.

<sup>56</sup> The earliest known surviving fragments of *De astronomia* appear in the early 9th-century manuscript, originating from the Abby of Saint-Amand en Pévèle in northern France (nearly equally southeast of Lille and southwest of Tournai). The manuscript is now in Valenciennes, Bibliothèque comunale, Ms Elnonensis 337 (ex-325). See LE BŒUFFLE 1983, pp. xlvii-xlviii; VIRE 1992, p. xiii and <https://gallica.bnf.fr/ark:/12148/btv1b8452596p>. LeBœuffle points out that the the model from which these fragmentary passages from Books I-III were drawn, Book II must have been illustrated due to the repeated marginal notations in the manuscript of *F[igura]* with the genitive form of the constellation's name (see esp. ff. 39r-41v). He also notes that similar notations appear in the 9th-/10th-century manuscript in Milan, Bibl. Ambrosiana, Ms M. 12 sup., which is probably from Corvey. See LE BŒUFFLE 1983, p. liv and VIRE 1992, p. xii.

<sup>57</sup> See APPENDICES I and II. As Viré notes, the *De Astronomia* was used extensively by Isidore, Abbo of Fleury, Robert Frescher and numerous anonymous authors during the Middle Ages and Renaissance. See VIRÉ 1981, esp. pp. 161-62, citing the previous works Middle Ages and Renaissance. See VIRÉ 1981, esp. pp. 161-62, citing the previous works by FONTAINE 1959-83, I (1959), pp. 111-12; van de VYVER 1935, esp. p. 141; and BUNTE 1876, pp. 155-86. As she points out, Abbo's treatise; usually signalled with the title *Excerptio Abbonis ex Igino de figuracione signorum* (as one sees it, for example, in London, BL, Roy. Ms 13.A. XI, cf. APPENDIX II, Group IV), was mistaken by one author as an original text by Hyginus himself (see HASPER 1861). For the influence on the *De Astronomia* on Renaissance authors, such as Matteo Palmieri, Leonardo Dati and Basinio da Parma, see LIPPINCOTT 2006, pp. 22-23.

illustrated Hyginus manuscript prior to the first half of the 11th century – a relatively late date when considering the development of the illustrations from comparable astronomical manuscripts. Moreover, when one begins to examine a few of the oldest surviving illustrated version of *De astronomia*, a whole raft of puzzling issues begin to emerge.

Two of the oldest of the surviving illustrated manuscripts are ones preserved in Leiden and in the Vatican.<sup>58</sup> The Leiden manuscript is a jumble of mismatched bits and pieces of parchment dating to c. 1025-30,<sup>59</sup> with both the script and the images having been convincingly attributed to the well-known bibliophile and monk Adémar de Chabannes (988-1034).<sup>60</sup> The manuscript seems to represent a collection of more than 60 texts that were compiled for his own personal use, but which might also have been collected to help him in his role as a

<sup>58</sup> Universiteitsbibliotheek in Leiden, Ms Voss. lat. 8°15 and Vatican, BAV, Reg. lat. 123. For a fuller discussion of these two manuscripts, see LIPPINCOTT 2014. There is also a valuable monographic study of the Leiden manuscript (with a current bibliography), in VAN ELS 2011 and VAN ELS 2015, as well as in his larger study on Adémar in VAN ELS 2020, esp. chaps. 2-6 and the Appendices.

<sup>59</sup> Viré describes the Leiden manuscript as: ‘... recopié pêle-mêle des notes éparses et des textes profanes et religieux sur les feuillets de dimensions inégales, sans souci de la mise en page. [...] Il a également veillé à illustrer de figures plusieurs des textes transcrits, encore qu’il s’agisse, plutôt que de dessins, d’esquisses griffonnées à la hâte sur des morceaux de mauvais parchemin ...’. See VIRÉ 1981, pp. 159-276, esp. p. 205. Note also Bethmann’s earlier comments concerning the apparent disunity of the manuscript, though he mistakenly believed it to contain several hands (BETHMANN 1843, pp. 574-77, esp. p. 574). Van Els suggests that the variety of parchments reflects the fact that the collation came together over a long period of time during which ‘the supply of parchment was constantly changing’. VAN ELS 2011, p. 31. See also LIPPINCOTT 2006.

<sup>60</sup> Byvanck was the first to propose the attribution to Adémar, arguing that the pages of the manuscript had been written and illustrated for the most part by one hand, suggesting they were ‘écrits en grande partie par Adémar pour son usage personnel’. See BYVANCK 1931, pp. 69-72, esp. p. 69. See also DELISLE 1896; PORCHER 1950, pp. 43-57, esp. pp. 50-54; GABORIT-CHOPIN 1967, pp. 163-225, esp. pp. 165-66; VIRÉ 1981, pp. 159-276, esp. p. 205; VAN ELS 2011 (who concludes that all the texts and illustrations are in Adémar’s hand, except for three cases, which he suggests were carried out by Adémar’s students at his own request; cf. p. 31) and VAN ELS 2015 and VAN ELS 2020. Adémar’s career swung between extended residencies in both St-Cybard d’Angoulême and St-Martial in Limoges and it seems most likely that these ‘notebooks’ travelled with him – though it is worth noting that the compilation was recorded in St-Martial in 1221 (cf. LIEFTINCK 1964-65, p. 100), where he had apparently left all his books prior to his ill-fated pilgrimage to Jerusalem in 1033 and where he seems to have died in 1034. For the most recent overview of Adémar and his oeuvre, see LANDES 1995 and VAN ELS 2020.

monastic teacher.<sup>61</sup> Despite its somewhat scrappy appearance, however, the Leiden manuscript is philologically exemplary and faithful to the structure of its classical model, presenting all IV Books of the *De Astronomia* in their canonical order. The illustrations accompany the text of Book III (ff. 172v-181v).<sup>62</sup>

In contrast, the Vatican manuscript is a beautifully-made prestige object.<sup>63</sup> It was written in the Spanish Monastery of Santa Maria de Ripoll some time prior to 1056, under the supervision of the well-known scholar, Brother Olivo. The actual execution of the manuscript has been attributed to another, less well-known and, perhaps, junior monk, named Arnaldus.<sup>64</sup> Its text is idiosyncratically constructed, having been compiled from a series of astronomical excerpts arranged according to four topics: *De sole*, *De luna*, *De natura rerum* and *De astronomia*. The descriptions of the constellations themselves have been taken from a number of classical and early-medieval authors, including not only Hyginus (Books II and III), but also ‘Aratus’, Pliny, Boethius, Bede and Isidore.

<sup>61</sup> Van Els study of the manuscript provides a series of insights into how the various pages were originally compiled, as well as how the original pages were rebound into fourteen separately-bound booklets in 1900. See VAN ELS 2011; VAN ELS 2015 and VAN ELS 2020. He also offers a resumé of the opinions of various scholars regarding how these texts were compiled and intended to be used, concluding that the manuscript should be seen as ‘an assemblage and adaptation of school texts [carried out] in a rather personal way’ (VAN ELS 2011, p. 28). See also the useful definition in O’DONNELL 1996, pp. 171-72 (cited by VAN ELS 2011, p. 28, n. 28): ‘an open-ended collection created and arranged for its usefulness to the author/owner, making sense purely in terms of the owner/ author’s needs’.

<sup>62</sup> In a recent article (LIPPINCOTT 2014, n. 8), I claimed that Patrick McGurk had erred in citing the Leiden manuscript and Munich, Staatsbibliothek, cgm 10270 as ‘being the only two out of twelve Hyginus manuscripts, which have survived from 1025 to 1225, to illustrate Book III, and not Book II...’ (see MCGURK IV 1966, p. xxii). I should have clarified this by saying that, of the early illustrated Hyginus manuscripts under consideration, the illustrations accompany Book II in four examples, and accompany Book III in five examples, while Vatican, BAV, Reg. lat. 123 and London, BL, Arundel 339 have a text combining extracts from both Books II and III.

<sup>63</sup> Viré describes the Vatican manuscript as: ‘... a une trace régulier tout au long du codex et le texte est agrémenté de tables astronomiques et des dessins en couleurs représentant les constellations, que qui nous permet de dire qu’il s’agissait d’un exemplaire de bibliothèque de belle qualité’. See VIRÉ 1981, pp. 159-276, esp. p. 205.

<sup>64</sup> See DELISLE 1896, pp. 241-35; VIRÉ 1981, p. 205, n. 3 and VIRÉ 1992, p. xvii.



Despite their differences in presentation and execution, however, each excerpt from Hyginus in the Vatican manuscript has been accurately copied from its original [con]text, with original spellings and grammar intact. As a result, it is possible to string-together the various fragments to form a fairly close approximation of the original text from which the Hyginian passages were taken. Once that is done, it turns out that the texts of the Vatican and Leiden manuscripts are actually extremely close, uniquely sharing a very precise group of readings that seems to resemble the lost classical prototype more closely than several of the other surviving manuscripts.<sup>65</sup>

Interestingly, if one can look past the stylistic differences between the two sets of illustrations and consider more closely how each figure constellation figure has been constructed — form, posture, attributes, clothing, etc. — it becomes clear that neither set of illustrations bears close resemblance to any surviving illustrations of the constellations that we assume were more-or-less directly derived from classical prototypes, such as those preserved in the Leiden *Aratea*, or the Basle or Madrid Germanicus manuscripts. Instead, the illustrations in the Leiden and Vatican manuscripts both appear to derive, ultimately, from a pictorial tradition most closely associated with the pseudo-Bedan *De signis caeli*. In particular, several of the defining features found in these two Hyginus manuscripts first appear in a Carolingian manuscript of the ps-Bedan *De signis caeli* from Fleury-sur-Loire (Paris, BnF, lat. 5543), though each represents a distinct variant of the original.<sup>66</sup>

The fact that both these manuscripts have imported illustrations associated with *De signis caeli* reinforces the sense that illustrated copies of *De astronomia* either had not survived or were not available in the European monastic scriptoria during the 11th century. That Adémar then found the task of marking the stars in these figures beyond his means points to how dissimilar the postures or orientations of the descriptions of the ‘Hyginian constellations’ in the text are from their ps.-Bedan textual and pictorial counterparts.

<sup>65</sup> See VIRÉ 1981, pp. 203-06. Explaining why two manuscripts from such different locations might be so close in their readings, Viré notes that the Monastery of Santa Maria in Ripoll was ‘*une foundation*’ of Saint-Victor de Marseille and enjoyed particularly close relations with other *scriptoria* in France, especially those in the Loire Valley and the north of France (VIRÉ 1981, p. 206).

<sup>66</sup> See BYVANCK 1949, pp. 189 and 191, GABORIT-CHOPIN 1967/1968, pp. 186-191 and McGURK 1973, pp. 198-99.

There is another text in the Leiden manuscript that also raises the spectre of an illustrated model. This is the anonymous medieval poem with the incipit of *Haec pictura docet quicquid recitavit Hyginus*, which provides a versified resumé of some of the main cartographical elements of the heavens contained in Books I and IV of *De astronomia*.<sup>67</sup> Amongst these, the author provides a fairly faithful rendering of Hyginus’s descriptions of how to trace the main celestial circles by noting through which parts of the figures of the constellations they pass.<sup>68</sup> Perhaps the most interesting part of the poem, however, are the opening lines, in which the author explains:

*Haec pictura docet quicquid recitavit Hyginus  
In septem quinque describens sidera signis  
Ad caeli terraeque globos in mole rotundos.  
Mallem prorsus opus solidis insigne figuris,  
Quas nequit in plano similes expendere quivis,  
Dum lateant intus quaedam curvisque profundis.*

<sup>67</sup> The poem appears on ff. 61r-62r with interlinear comments by Adémar himself. It immediately precedes a copy of Priscian’s *Ad boreae partes...* (fol. 62r), but is otherwise currently separated from the other astronomical texts in the manuscript.

The poem was first edited by BURSIAAN 1866, pp. 786-88, who used the version of the poem that appears on fol. 138r of the mid-11th century (c. 1060-63) manuscript from St-Germain-des-Prés in Paris, Paris, BnF, lat. 12117, where the poem itself follows directly after an illustrated version of the *De ordine ac positione stellarum* (ff. 131r-137v).

For later editions, see RIESE 1870, pp. 221-23, no. 762/ 1894<sup>2</sup>, pp. 243-46, no. 761 (with readings from the Paris and Leiden manuscripts); BAEHRENS 1879-88, V (1883), p. 380, no. LXVIII; and VAN ELS 2011, pp. 651-55 (providing a comparative reading from Bursian and Riese against the Leiden manuscript).

The poem also appears in the 15th-century manuscript in Genoa, Biblioteca universitaria, Ms E. III. 28, ff. 238r-v, preceding an excerpt from Hyginus (fol. 239r: *Aplanis supere centron dixere priores...*). See TAMBURINI 1958, VII, p. 1026 (<https://manus.iccu.sbn.it>) and KRISTELLER 1963-97, I (1963), p. 243.

<sup>68</sup> See APPENDIX III. Only four of the ten celestial circles are fully described in the poem: the Arctic Circle, the ‘Solstitial Circle’ (the Tropic of Cancer), the ‘Circle of the Hours’ (the Celestial Equator); the ‘Winter Circle’ (the Tropic of Capricorn). See the discussion of the poem in LE BŒUFFLE 1983, p. xlv; STÜCKELBERGER 1990, p. 75; STÜCKELBERGER 1994, p. 36; DEKKER 2013, pp. 190-91 and VAN ELS 2015, pp. 651-55.



(‘This picture shows what Hyginus set out in his description of the stars in the 35 constellations on the huge, round spheres of the sky and the earth. Of course, I would prefer a work with three-dimensional figures, which no one can represent exactly and realistically on a flat surface, because some parts [of them] are hidden inside [the sphere] and [behind its] curves’.)

The suggestion that the author is describing some kind of two-dimensional map, which has recorded the positions of Hyginus’s constellations relative to the celestial circles, immediately brings to mind the relatively large number of celestial maps that one finds in a wide range of Medieval and early Renaissance manuscripts.<sup>69</sup> And, indeed, if one compares the descriptions in the poem with the positions of the constellations depicted in some of these maps there is – taking into consideration a certain degree of artistic license – a remarkably high level of concordance (see APPENDIX IV).<sup>70</sup>

Nevertheless, whereas it is possible that the poem does record the details of a celestial map – a possibility that might help to explain some of the discrepancies between the poem and the original text of *De astronomia* – the descriptions provided in the poem in its current form are not sufficiently detailed to suggest that it could ever have been used to *construct* a celestial map. There is no indication on how the circles themselves are to be drawn; and, even if one imagines an extremely simplified map of the celestial hemispheres, the author has failed to include information concerning the constellations that mark the equinoctial and solstitial colures, which are vital to any such rendering.<sup>71</sup>

<sup>69</sup> For the most complete survey of these maps, see DEKKER 2013, esp. pp. 116-256 and 432-36.

<sup>70</sup> This point has been made by van Els, suggesting that: ‘*De tekst geeft een gedetailleerde beschrijving van een hemelkaart als alternatief voor de hemelglobe die Hyginus gebruikt ter verduidelijking van de De astronomia*’. (‘The text provides a detailed description of a celestial map as an alternative to the celestial globe that Hyginus uses to illustrate *De astronomia*’). See VAN ELS 2015, p. 651.

<sup>71</sup> There is, of course, the possibility that the poem has survived in an incomplete form and may have originally included descriptions of the other circles in a series of lines that have been lost from the end of the current poem. If so, the possibility that it describes an existing map with such accuracy that it alone could be used as a guide to construct a new picture would be significantly increased.

In this context, one should mention another poem that contains a variant to this mapping system and which also credits Hyginus amongst its inspirations.<sup>72</sup> This work is found in an early 12th-century manuscript collection of computus material and astronomical texts. The poem describes a celestial sphere divided into five zones and lists the constellations that fall within each zone from the north to the south. Again, from the descriptions provided, it would be impossible to construct a meaningful celestial map, but one might be able to create something more rudimentary, such as a reduced version of the type of maps one finds in manuscripts of the *Revised Aratus latinus*, where the figures tend to be contained within the parallels rather than marking them out,<sup>73</sup> or the labelled planispheres that appears in the Aberystwyth Germanicus manuscript<sup>74</sup> and in the various copies of the *Liber Floridus* by Lambertus of St Omer.<sup>75</sup>

The Darmstadt poem is, perhaps, the most frustrating example of this small group of astronomical verses, since the text appears in the manuscript physically enveloping a map of the northern and southern hemispheres (fol. 61r), which bears the evocative legend:

*Inde profunda patent. Hinc sensibus abdita lucent.  
Quod mentem refugit. Solet ars reserare figuris.*

<sup>72</sup> Darmstadt, Landesbibliothek, Ms 1020. The poem appears on ff. 60v-61v. The text of the poem bears the incipit: *Summa meae cartae brevis est divisio sperae...*; and the explicit: *Hec ita Gerbertus cui testis et auctor Higinus* (‘The subject of my brief pages is the division of the sphere — Gerbert was thus a witness to this, and the author Hyginus’). The poem was first edited and discussed by DEKKER 2013, pp. 182-83; 186 and 189-192. The manuscript itself bears a record of being in the Abbey of St-Jacques in Liège (Sint-Jacobskerk in Luik) in present-day Belgium the 15th century.

<sup>73</sup> For a selection of images, see DEKKER 2013 and [www.thesaxlproject/celestialmaps/hemispheres](http://www.thesaxlproject/celestialmaps/hemispheres). The most interesting in this regard are the decorative hemispheres from the 15th-century manuscript, Vatican, BAV, Reg. lat. 1324, fol. 23v. For a description and reproduction, see DEKKER 2013, pp. 221-222.

<sup>74</sup> Aberystwyth, NLW, Ms 735C, fol. 25r. For a facsimile reproduction and discussion see LIPPINCOTT 2019c, pp. 27-28 and 71-72 (German transl. Peter Diemer); and 224-5 and 263-64 (English).

<sup>75</sup> For a list of the maps in the manuscripts of the *Liber Floridus*, see LIPPINCOTT 2019c, p. 43, nn. 133-34 (German) and p. 239, nn. 133-34 (English). See also [www.thesaxlproject/celestialmaps/planispheres](http://www.thesaxlproject/celestialmaps/planispheres).

(‘Here secrets become plain. Here shine things hidden from the senses.  
What escapes the mind, art uses to disclose through figures’.)<sup>76</sup>

The self-proclaimed purpose of this map is to illuminate – in the sense of ‘bring into the light’ – those things that are invisible to the eyes: specifically, the invisible celestial circles that Hyginus describes in Book IV of *De astronomia*. Unfortunately for those who like tidy solutions, the setting of these hemispheres within the text of a poem claiming to show the influence of Hyginus is more generic than causal. For, as Dekker’s close analysis of the Darmstadt map has shown, there is no direct cartographic relationship between it and the poem: the former illustrates definitions of the celestial circles by means of the constellations through which they pass; the latter discusses the celestial zones into which each constellation falls. Moreover, the poem specifically mentions Libra and the map omits it; and the map is divided into hemispheres along the equinoctial colures, while the poem uses the summer solstice as its main marker.<sup>77</sup> Nevertheless, there is no denying that they share a common heritage, both stemming – ultimately – from a tradition that uses words, rather than numbers, to describe the mechanics of the sky.<sup>78</sup> Their differences, however, point to variants in that tradition whose detailed history we still do not fully understand.

<sup>76</sup> Ed. and English transl DEKKER 2013, pp. 251-52.

<sup>77</sup> DEKKER 2013, pp. 189-91. Dekker notes (p. 191) that Priscian’s *Ad boreae partes...* and the poem *Haec pictura docet...* begin their sequences with the summer solstice in Cancer, which stems from the Aratean tradition, while the *Descriptio mundi secundum Hygini* begins with the vernal equinox in Aries. She draws attention to Hyginus’s own notation of this discrepancy in *De astronomia* IV, 4: *Sed Aratus non, ut reliqui astrologi, ab Ariete duodecim signa demonstrat, hoc est vere incipiente, sed a Cancro, hoc est ipsa estate* (‘But Aratus does not present, as the rest of the astrologers do, the twelve signs beginning with Aries, that is to say, beginning with the spring, but with Cancer, which is summer itself’). Ed. LE BŒUFFLE 1983, p. 122 and VIRÉ 1992, p. 133 (as IV, 5).

<sup>78</sup> See DEKKER 2013, pp. 189-192 and her suggestion that it may be related to the construction of a celestial globe connected to Gerbert himself (pp. 201-207). In particular, her conclusions that ‘... conceptually, Gerbert’s spheres belong to the descriptive tradition as outlined by the Latin literature available in his day. [...] Gerbert’s spheres seem to have been the first and last demonstrational instruments based on the Aratean literature made in the Latin West for teaching the structure of the universe’ (p. 207). The only adjustment one might make would be to note that all these models specifically evoke the name of Hyginus and, as such, they owe a greater debt to the lucid ‘textbook’ instructions provided by Hyginus, than to the more amorphous poetry of Aratus and his Latin translators.

Therefore, whereas we must accept the claims made by both authors that they have been inspired to write his poem by a two-dimensional image that was associated with the name of Hyginus, we are no closer to understanding what a ‘Hyginian constellation’ might have looked like – if such a thing, in fact, ever existed.

One final twist in this puzzle, however, appears in a group of early Hyginus manuscripts, which all share a set of unusual depictions of the constellations that do not appear in other illustrated versions of *De astronomia* and, seemingly, can all be traced to an exemplar coming from southern Germany.<sup>79</sup> These include:

- HERCULES is not depicted within the Garden of the Hesperides.<sup>80</sup>
- One or more of the grouping of CEPHEUS/CASSIOPEIA/ ANDROMEDA and PERSEUS are stacked vertically in the margin.
- ANDROMEDA is walking and has neither chains nor rocks.
- DELPHINUS is placed upside-down on the page with its body arched so that it forms a ‘C’.
- The GEMINI are nude and walk in the same direction with their inner arms intertwined.
- ERIDANUS is depicted as a stream, rather than as the more conventional image of a classical river-god.<sup>81</sup>

<sup>79</sup> Group Ia:  
S Paul im Lavanttal, Benediktuskabinett, Ms 16/1 (S German (Constance?) 11th c)  
Florence, BML, Ms Plut. 29.30 (N Italy/S Germany?; 12th c)  
Leiden, Universiteitsbibliotheek, Voss. lat. 8°18 (S Germany/Italy?; end 15th c)  
Some similarities can also be found in the related Group 1 b and 1c:  
Wolfenbüttel, Herzog August Bibliothek, Ms 18. 16. Aug 4° (S Germany (nr Regensburg?); 12th century)  
London, BL, Arundel Ms 339 (Kastl (Bavaria); c. 1200/before 1230)  
Vienna, ÖNB, VIndob. 51 (S. German (nr Weingarten?); 12th c)  
The manuscripts are fully described in BLUME/HAFFNER/ METZGER 2013 and 2016, *ad. cit.*; and in the appropriate pages of [www.thesaxlproject.com](http://www.thesaxlproject.com).

<sup>80</sup> Though it should be pointed out that there are also examples of Hercules without the tree and the Snake in manuscripts of the ps.-Bedan, *De signis caeli* and in the *De ordine ac positone stellarum* manuscripts. For illustration of these figures, see [www.thesaxlproject.com/hercules](http://www.thesaxlproject.com/hercules).

<sup>81</sup> Eridanus is a stream in Florence, BML, Plut. 29.30 and in Leiden, Univ.-bibl., Voss. lat. 8°18. This feature also appears in two of the other early Hyginus manuscripts: Vienna, ÖNB, Vindob. 51 and Leiden, Univ.-bibl., Voss. lat. 4°92. For a more detailed study of the depictions of Eridanus, see LIPPINCOTT 2009.



All these features are extremely rare in the so-called 'Aratean' corpus of illustrations, but they do appear on antique celestial globes and, most tellingly, in a number of contemporary hemispheric and planispheric maps.<sup>82</sup>

As seems to have been the case with the previously-discussed Leiden and Vatican manuscripts, when the compilers of these volumes were confronted with blank spaces in need of illustrations, they appropriated images from another source – in this case, one assumes, the artists turned to a two-dimensional map of the heavens. It would be overly hasty, however, to assume that this collection of images reflects a knowing appropriation of a more 'authentic Hyginian pictorial source' than, say, the illustrations that appear in the *De signis caeli*. For one thing, none of these images have been marked with stars. Nor, in the majority of cases, would it have been possible to place the stars in these drawings in accordance with the descriptions found in Book III of *De astronomia*, because the figures soon show themselves all to have been all formed following a different iconographic model than the one employed by Hyginus. An additional curiosity is that, in all but one of these manuscripts, the illustrations have been inserted into the mythological sections of Book II, rather than alongside the descriptive star catalogues in Book III;<sup>83</sup> and there is only one example where the mythological associations come to the fore: since, rather than depicting the constellation of Taurus as the *protome* of a Bull, it is represented as a full steer, with the hapless Europa riding on his back.<sup>84</sup>

In general, then, the illustrations in medieval manuscripts of *De astronomia* tend to fall into two camps. On the one hand, most of the pictures in these manuscripts have been adopted and adapted from contemporary illustrations

<sup>82</sup> For illustrations, see [www.thesaxlproject.com/illustrations/celestialmaps](http://www.thesaxlproject.com/illustrations/celestialmaps). These pictorial similarities have been noticed, independently, by BLUME/ HAFFNER/ METZGER 2013, I, 1, pp. 123-25; 248-49; 304-05; 522-23; 538-59 and 559-60; and BLUME/ HAFFNER/ METZGER 2016, II, 2, p. 639.

<sup>83</sup> The anomaly is London, BL, Arundel Ms 339, where the pictures appear in a unique version of the text that conflates the information from both Book II and III (ff. 73r-85r). This adheres (certainly coincidentally) the format in which information on each of the constellations is presented in the *Catasterisms* of Eratosthenes.

<sup>84</sup> See the St Paul im Lanvanttal manuscript (fol. 14v), the Laurenziana manuscript (fol. 18r) and in Leiden, Univ.- bibl. 8° 18 (fol. 113v). The London and Wolfenbüttel manuscripts depict Taurus as a full Bull.

taken from other texts from the Aratean corpus, including the *Revised Aratus latinus*, the *De signis caeli*, the *De ordine ac positione stellarum in signis* and the Latin translation of Aratus by Germanicus. On the other hand, there is one tightly-knit group of manuscripts whose illustrations bear a strong resemblance to images that appear in contemporary celestial maps, and this is paralleled – as we have seen – by a persistent evocation of the 'sphere of Hyginus' in didactic poetry from the 11th century onwards.

Judging from surviving manuscripts of the text of *De astronomia*, interest in the text appears to have waned between late 12th and early 14th centuries. One possible reason for this may have been the new availability of Ptolemy's *Syntaxis mathematica* through the 12th-century Latin translations of John of Seville and Gerard of Cremona, which provided a more highly-detailed and, one might say, more reliable vision of the night sky through the reintroduction of mathematical astronomy to the Latin West. Another reason might be due to the development of universities as centres of learning, where the teaching syllabus relied most heavily on Sacrobosco's *De sphaera* as the basic text for introducing students to astronomical principles.

### The text and illustrations of *De astronomia* during the Italian Renaissance

An interest in *De astronomia* re-emerges as part of the surge of interest in Classical Antiquity by the early Italian humanists. By-and-large, this meant that most of the commissioners of these manuscripts were interested in the 'Classical aura' of the text, with a particular concern for linguistic philology and text's role as a historical witness and cultural relic. The 'astronomy' of the figures and maps tended to play a secondary and, in many cases, mainly decorative role in these manuscripts, since whatever 'scientific' utility the descriptive tradition might have once had, it was essentially eclipsed by the much more accurate information supplied in the star catalogues (and their illustrations) derived from the Latin



translations of Books VII and VIII of Ptolemy's *Almagest*.<sup>85</sup> As a result, Renaissance manuscripts of *De astronomia* become more of a cultural commodity – the purview of the intellectually curious and the enlightened collector.

There are over 20 surviving illustrated manuscripts of the text dating from the relatively short period of c. 1370-80 to the early 16th century that can be traced to various Italian scriptoria.<sup>86</sup> The earliest surviving copy of these illustrated Italian Renaissance manuscripts appears to be Vatican, BAV, Vat. Lat. 3110, which contains two copies of the text (one nearly complete version that is not illustrated and one partial version, which is illustrated), along with the Germanicus translation of Aratus (without *scholia*), excerpts from Book VIII of Martianus Capella's *De nuptiis Mercurii et Philogiae* and the allegorical interpretation of Virgil by Fulgentius, here entitled *De intellectu librorum Virgilii*.<sup>87</sup> The manuscript has long been identified with the Florentine humanist and statesman, Coluccio Salutati (1331-1406), with several sections of the text and many of the annotations have been written in his own hand.<sup>88</sup> The beautiful pen-and-wash illustrations that have been meticulously marked with red stars and accompany Book III of the second version of *De astronomia* (ff. 63r-83v)

<sup>85</sup> One interesting exception, however, is the star lists that are included in the astronomical chapters of Domenico Bandini's *Fons memorabilium universi*, where he compares the texts and illustrations deriving from both Hyginus and the Latin translation of Ptolemy's *Almagest*. Usually he declares Ptolemy to be the more reliable source, but not always. See the discussion in LIPPINCOTT 2019b.

<sup>86</sup> For a list of these manuscripts, see BLUME/HAFFNER/METZGER 2016, II, 2, p. 974. One should add to this list: Vatican, BAV, Vat. lat. 3109 and Vatican, BAV, Chigi Ms H. IV 120. See also ZUCKER 2017, pp. 153-212.

It should also be noted that seven of the manuscripts in this list from southern Germany actually represent a set of star-catalogues derived from Book III of *De astronomia*, known as '*De signis et imaginibus coeli secundum Hyginum*' which are all very closely related to the prototype, Berlin, PKB, Ms lat oct. 44. For a discussion, see BLUME/HAFFNER/METZGER 2016, II, 1, pp. 79-80 and *ad. cit.* in the catalogue.

<sup>87</sup> The organisation of the material in this manuscript is complicated. The best overview appears in BLUME/HAFFNER/METZGER 2016, II, 2, pp. 553-57 (no. 68). See also SAXL 1915, I, 88-80 and [www.thesaxlproject.com](http://www.thesaxlproject.com), *ad. cit.*

<sup>88</sup> See MCGURK 1966, p. xix. See also DE LA MARE 1973, I, i. p. 41; REEVE 1980; ULLMAN 1963; ROSS 1981; WITT 1983; *Vedere i classici* 1996, pp. 251-53. WITT 2000; and LIPPINCOTT 2017, esp. pp. 38-40.

certainly reflect the skill of a professional illuminator.<sup>89</sup> The origin of these pictures, however, remains uncertain. As Haffner has noted, some of the figures seem show signs of being having been influenced by Classical models, while others are depicted wearing contemporary dress; some betray elements only found in the constellations from celestial maps and globes, while a few seem to hark back to earlier, fantastic medieval depictions.<sup>90</sup> The question as to whether these images represent a new iconography created, arguably, through a collaborative effort between the artist and his patron, or if they reflect clever Renaissance 're-stylings' of an older cycle of pictures cannot be fully addressed here.<sup>91</sup> For the purposes of this essay, it is more important to recognize that the impact of the illustrations in Salutati's manuscript was over-whelming and influenced the iconography of almost all the subsequent Renaissance manuscripts of *De astronomia*.<sup>92</sup> Moreover, they also served as the model for a number of new compositions, such as the *Fons memorabilium universi* of Domenico Bandini's (c. 1370 – 1418);<sup>93</sup> Basinio da Parma's *Astronomica* (c. 1455)<sup>94</sup> and the *Città di Vita* by Matteo Palmieri (1465).<sup>95</sup> They even influenced the iconography

<sup>89</sup> The drawings have been attributed to a follower of Bernardo Daddi and dated to around 1350. See DEGENHART/SCHMIDT 1968-82, I (1968), p. 75. Haffner suggests a slightly later date of the second half of the 1370s (post-dating Salutati's arrival in Florence from Rome in 1374), and sees similarities with the style of Andrea's Bonaiuti's frescoes in the Cappella degli Spagnuoli in Santa Maria Novella (c. 1343-55). See BLUME/HAFFNER/METZGER 2016, II, 2, p. 557.

<sup>90</sup> BLUME/HAFFNER/METZGER 2016, II, 2, pp. 554-57 (no. 68).

<sup>91</sup> Given Salutati's Humanist credentials, his reputation as a manuscript-hunter and the fact that this manuscript contains a version of the *Aratea* which Salutati proudly notes he had 'discovered' (fol. 54r: *Inveni librum metricum et prosaicum*), I would tend towards arguing in favour of these illustrations being a 'Renaissanced' version of a pre-existing set of illustrations, though it is definitely a topic that requires closer study.

<sup>92</sup> For a quick overview of the relationship between these manuscripts, see LIPPINCOTT 2006, pp. 21-23; 32, n. 66 and 33, n. 76. See also BLUME/HAFFNER/METZGER, II, 1, pp. 97-102 and the catalogue entries, *ad. cit.*

<sup>93</sup> Domenico Bandini d'Arezzo (1435/40-1418) was a close friend and associate of Salutati. For the influence of Salutati's Hyginus on Bandini, see LIPPINCOTT 2019b.

<sup>94</sup> For the influence of Salutati's manuscript on Basinio da Parma, see LIPPINCOTT 2006, pp. 22-23 and 33, nn. 73-76 and BLUME/HAFFNER/METZGER 2016, II, 1, pp. 99-102.

<sup>95</sup> See Matteo Palmieri's *Città di Vita* manuscript (Florence, BML, Plut. 40, sup. 53), which discussed in LIPPINCOTT 2006, pp. 22 and 33, n. 72 and BLUME/HAFFNER/METZGER 2016, II, 1, pp. 97-98 and II, 2, pp. 625-29 (no. 86).

of much later large-scale decorative fresco cycles.<sup>96</sup> Moreover, the text preserved in Salutati's manuscript served as the model for several of the subsequent printed version of the text.

The impact of Salutati's manuscript on the astronomical iconography of the early Italian Renaissance cannot be over-estimated and fully deserves a monographic study in its own right. Nevertheless, its influence – though intense and pervasive – was oddly short-lived. This was due to a series of decisions made by the publisher of the first illustrated edition of *De astronomia*, Erhardt Ratdolt.

### The early printed versions of *De astronomia*

The earliest edition of the Hyginus text was printed in Ferrara in 1475 by Agostino Carnerio.<sup>97</sup> Philological evidence suggests that the text was copied from a contemporary, 15th-century manuscript, close to Salutati's exemplar and keeping all the idiosyncratic readings. As the textual relationship amongst these early Renaissance manuscripts is so close, it is difficult to trace the exact manuscript (if, indeed, it still survives), though one simple, but telling, detail can be found in the description of the stars of Sagittarius in Book III, where the star that should be listed as being *in poplite* ('in the knee') appears as *in pollice* ('in the thumb'). In the Hyginus manuscripts from the 15th century, though, this small oddity becomes the norm, with at least twelve manuscripts preserving the error in the text and/or in the illustrations of the constellation.<sup>98</sup>

<sup>96</sup> For the influence on one detail in the frescoes in the Salone dei Mesi in the Palazzo Schifanoia in Ferrara (c. 1469), see LIPPINCOTT 2006, pp. 21-23.

<sup>97</sup> HAIN 906; GW n0368; ISTC ih00559000; USTC 994237. For further information on the Carnerio press (which appears to have been started by Antonio's father, Bernardo, in 1474 and ceased operation in 1478), see BARUFFALDI 1777, pp. 60-69; ANTONELLI 1830, pp. 30-31 (no. 26); CITTADELLA 1873, pp. 13-15; FUMAGALLI 1905/1966, s. u. Ferrara; BMC 1909, vol. X, p. 106; SCHOLDERER 1925/1966; *DBI* (P. Veneziani), vol. XX, 1977, pp. 464-65; McKITTERICK 2003, p. 76; McKITTERICK 2014.

<sup>98</sup> It is worth noting that modern editors of Hyginus, such as Le Boeuffe and Viré, generally do not include readings from these 15th-century manuscripts as part of their apparatus. The star '*in pollice*' appears in Cambridge, Fitzwilliam Museum, Ms 260; Florence, Bibl. Laurenziana, Ashb. 1148 (with a marginal correction) and Plut. 89, sup. 43; Milan, Bibl. Ambrosiana, T. 47 sup.; New York Public Libr., Spencer 28; Oxford, Bodleian Libr., Can. class. lat. 179 and Can. misc. 46; Pavia, Bibl. Universitaria, Aldini 490; Siena, Bibl. Comunale, L VI 25; Vatican, BAV, Urb. lat. 1358 and in Salutati's manuscript, Vat. lat. 3110.

The 1475 Ferrarese edition was not illustrated, but spaces were left in the text for decorative capitals and images. As is well known, this was not an uncommon practice with the earliest books printed in Italy and, especially, those printed by native Italians.<sup>99</sup> It is not clear whether this was due to the fact that Italian printers had yet to master the specialist skill of woodcut book illustrations, or that their clients preferred books that could be more elaborately illuminated by accomplished miniaturists. The former is certainly plausible, given the level of technical expertise required to complete this process successfully. If the latter is the case, however, it is easy to imagine such a decision reflecting a combination of purely aesthetic preference, the desire to personalise and 'add value' to what might have been perceived as a 'mass-produced object' and, perhaps, a certain degree of inherent conservatism – although, as David McKitterick has warned: 'It is always dangerous to make assumptions about the expectations of readers'.<sup>100</sup> With regard to the Carnerius edition of Hyginus, McKitterick has noted that only three of the fourteen known copies of the volume have had manuscript illustrations inserted.<sup>101</sup>

<sup>99</sup> For an overview of this practice, see ARMSTRONG 1994, pp. 35-47. Note especially her observation that: 'The technology of printing woodcuts simultaneously with the text was well developed in Germany in the 1470s, but with few notable exceptions, Italian printers had resisted incorporating many woodcuts into their publications until the end of the 1480s' (p. 45). See also BROWN 1891, p. 27; GERULAITIS 1976, pp. 18-19; ARMSTRONG 1991; McKITTERICK 2014, pp. 68-82.

<sup>100</sup> McKITTERICK 2014, p. 70.

<sup>101</sup> McKITTERICK 2003, pp. 75-79, fig. 20 and McKITTERICK 2014 citing the copies to which illustrations have been added (Cambridge, Trinity College, Grylls 3. 290; Naples, Bibl. Naz., S.Q.VII.C. 6 and Rome, Bibl. Lancisiana, Inc. 44), as well as those that have some additional diagrams and the nine copies in which blank spaces have been left. As McKitterick notes, the illustrations in the Trinity College volume strongly reflect the pictorial traditions found in 15th-century manuscripts of Hyginus. To his citation of the similarities between some of the Trinity illustrations and those in the Paduan manuscript, Milan, Bibl. Trivulziana, T. 47 sup., one might also add the close resemblance of the depiction of Argo to those in Florence, BNC, Magl. XI, 141; Oxford, Bodleian Libr., Can. class. 179 and Verona, Bibl. Capitolare, Ms 261. The Lancisiana pictures also appear to have been copied from a 15th-century Hyginus manuscript. I thank David McKitterick for sharing his illustrations of this volume with me. See also the list of copies and fragments of the edition in <https://www.gesamtkatalogderwiegendrucke.de/docs/HYGINUS.htm#GW13681>.



The first illustrated edition of *De Astronomia* was published by Erhard Ratdolt in Venice in 1482.<sup>102</sup> In this version, each of the 41 constellations that Hyginus describes in Book III is followed with a relatively large woodcut figure in which the stars have been marked.

The editors of Ratdolt's volume are named as Jacobus Sentinus and Johannes Lucilius Santritter, both of whom provide self-promotional poems at the end of the volume. From the poems, it seems that Sentini was responsible for editing the text and Santritter – who is often praised by contemporaries for his mathematical skills – was either the advisor or 'artist' behind the woodcut figures.<sup>103</sup>

In his valedictory poem, Santritter claims that their edition is better than any existing manuscripts and the previous edition.<sup>104</sup> From a close examination of the text, however, one can see that it actually relies very heavily on a manuscript that was very close to the one used by Carnerio – so close, in fact, that it raises the possibility that it might have been copied more-or-less directly from the Ferrarese edition itself, with the only significant differences being in the page layout and the abbreviations used.

In the second poem by Sentini, he claims that the two of them have 'healed all the wounds' from the previous editions and credits Santritter with having 'stayed up all night watching the stars in order to place them in their proper

<sup>102</sup> For more on Ratdolt and his activities, see REDGRAVE 1894; SCHRAMM 1943/1981, pp. 3-15; GERULAITIS 1976; EISENSTEIN 1979, II, p. 587, n. 34; LOWRY 1991, pp. 211-13; LANDAU – PARSHALL 1994, pp. 180 and 381, n. 13; DE SIMONE 2004, pp. 54-56 and 75-77.

<sup>103</sup> Sentini calls Santritter 'doctus' in his colophonic poem. See REDGRAVE 1894, p. 18; HIND 1935, II, p. 462; POLLARD 1914, pp. 24-25; McKITTEK 2014, p. 73. It is worth noting that the two poems celebrating Sentini and Santritter's collaboration disappear from subsequent editions, while the longer descriptive poem by Sentini remains.

<sup>104</sup> ...*In quo si quid erit: quod non tibi parte placebit*  
*Ex omni: vitio non mihi quaeso dabis:*  
*Ni prius Iginii cernes monumenta virorum.*  
*Scripta manu: vel quae pressa fuere prius:*  
*Quae si sorte voles trutina pensare modesta*  
*Te reus in nulla iudice parte ferar....*

('If what you have here does not please you, compare it with the manuscripts, or with the earlier printing, and you will be able to judge for yourself'). English transl McKITTEK 2014, p. 75.

locations.' Whereas Santritter may have stayed up all night working on this volume – as we will see – his time was certainly not spent watching the night sky.<sup>105</sup>

For, whereas the text of Ratdolt's 1482 edition has a clear connection to extant 15-century Hyginus manuscripts, the link between the woodcut illustrations and any of the existing Hyginus manuscripts is less apparent. This perception may be due partly to the 'Germanic' pictorial style in which the illustrations have been executed, which is markedly different from the suavely classicizing or charmingly courtly illuminations that appear in most contemporary Italian manuscripts of Hyginus's text. Nevertheless, in 1983, Ulrike Bauer<sup>106</sup> proposed that the images of the constellations in Ratdolt's volume were not related to existing Hyginus manuscripts but, instead, were drawn directly or indirectly from the illustrations that appear in the late-medieval manuscripts of Michael Scot's *Liber introductorius* and the related *Liber de signis et ymaginibus celi*.<sup>107</sup>

<sup>105</sup> The claim appears in the second of the three poems at the end of the text:

*Hic mansit tota spectans ad sidera nocte*  
*Poneret in propriis ut sua signa locis ...*

('He remained here all night watching the stars to place the stars in their proper signs'...).

<sup>106</sup> BAUER 1983, p. 12. Although Georg Thiele signalled a connection between the 'woodcuts of the oldest prints' (*die Holzschnitte der ältesten Drucke*) of the constellations with the Viennese manuscript, Vindob. 2352 – the author of which he appears not to have known and describing the manuscript only as 'a pedestrian medieval description of the sky' ('...gehört zu einer mittelalterlichen prosaischen Himmelsbeschreibung', cf. THIELE 1898, pp. 149-150) – Bauer was the first to make the connection between Michael Scot and the Ratdolt illustrations explicit. She notes that the woodcuts in Ratdolt's 'second' edition (1485) have been copied from Michael Scot, but does not mention that the same is true for the 1482 edition (though she does cite the earlier edition on p. 71). She also draws attention to the repeated use of the woodblocks in Ratdolt's 1488 Augsburg edition of the *Flores Astrologiae* of Albumasar, and cites the similar Michael Scot-based images in the Germanicus *Aratea* (Venice: de Strata, 1488), the Ratdolt edition of Leopold of Austria's *Compilatio de astrorum scientia* (Venice, 1489 OS) and the illustrations in the *Astronomici veteres* (Venice: A. Manuzio, 1499; cf. PONTANI/LUGATO 2017), as well as in two large-scale decorative cycles.

<sup>107</sup> The exact relationship between the texts of the tri-partite *Liber Introductorius* and the much more compact *Liber de signis et ymaginibus celi* (as well as the 'authorship' of the surviving versions of both texts) remains the subject of scholarly debate. For the differing views, see EDWARDS 1978, pp. xx-xxii; EDWARDS 1985; BURNETT 1994; ACKERMANN 2008; GREBNER 2008a, p. 285-86; GREBNER 2008b, pp. 253-56; ACKERMANN 2009, pp. 66-75.

As we have seen, whether born from necessity or convenience, the illustrations in many Hyginus manuscripts appear to have been 'lifted' from a wide range of other related astronomical sources. Discovering that the first Renaissance edition of a widely-circulated classical text has been illustrated with constellation images taken from a highly idiosyncratic medieval compilation, however, seems somewhat disconcerting, particularly since there was already a well-established pictorial tradition within contemporary manuscripts of *De astronomia* for how the constellations ought to be presented. Be that as it may, a sense of discomfort is fully warranted in this particular case, as nothing about this apparent 'adoption' turns out to be straight-forward.<sup>108</sup>

Citing Scot as the source for Radolt's woodcuts raises a number of issues. The first concerns the textual and pictorial sources that Michael Scot himself used when compiling his treatise. In 1898, Georg Thiele noticed that some of Michael Scot's illustrations seemed to 'imitate' (*anknüpfen*) the images that appear in the 12th-century Germanic manuscript now in Madrid (hereafter Madrid 19),<sup>109</sup> which preserves the Latin translation of the *Phaenomena* of Aratus interspersed with sections of prose text – known as the '*scholia Stroziana*' – that provide ancillary information about the mythological origins of each constellation and a list of the positions of the stars.<sup>110</sup>

Second, however, is the fact that the precise connections between Madrid 19 and the text and illustrations of Michael Scot's manuscripts is difficult to pin down, since there are a sufficient number of differences to suggest that either

<sup>108</sup> Comparisons can be made between the numerous versions of Scot's illustrations and the images that appear in Radolt's 1482 volume by consulting the relevant pages on each constellation in [www.thesaxlproject.com](http://www.thesaxlproject.com) or BLUME /HAFFNER / METZGER 2016. Note also that all the illustrations in the Hyginus manuscript in Vienna (ÖNB, Vindob 3111) and some of them in the Basinio da Parma manuscript in Florence (Bibl. Marucelliana, Ms C. CCLI) have been copied from the printed edition of Hyginus containing Michael Scot's illustrations.

<sup>109</sup> THIELE 1898, pp. 149-50. Madrid, Bibl. Nacional, Matritensis 19 (olim Fol. A. 16). Several aspects of this fascinating manuscript – such as the place of its manufacture and its possible travels after it was written – remain the subject of intense scholarly debate. The range of views on Madrid 19 is well summarised in OROFINO 2013, pp. 32-39. For the most recent discussions of the relationship between Madrid 19 and Michael Scot's illustrations, see OROFINO 1994, pp. 135-41; GREBNER 2008b; ACKERMANN 2009; BLUME/HAFFNER/ METZGER 2013, I, pp. 202ff, 346ff, no. 32; OROFINO 2013, pp. 32-41; BLUME/HAFFNER /METZGER 2016, II, 1, pp. 30-48 and LIPPINCOTT 2017.

<sup>110</sup> So-called on account of their appearance in Florence, Bibl. Laurenziana, Strozzi 46, a 14th-century manuscript also once owned by Coluccio Salutati. For additional information, see ULLMAN 1963, pp. 168, 188-89 and pl. VII, 2; DE LA MARE 1973, I, p. 41; REEVE 1980, pp. 511-12.

there was more than one intermediary between Madrid 19 and Michael Scot's original composition and/or between Scot's original work and the earliest surviving illustrated manuscripts,<sup>111</sup> or, that Michael Scot himself possessed an alarming inability to 'read' pictures.

The third is Michael Scot's apparent discomfort with the 'pagan' content of the poem upon which he has based his text. Far from being a champion for the Classical tradition, Scot himself argues that the pagan myths underpinning the forms of the constellations provide little value to the 'modern' astrologer.<sup>112</sup> Instead, he uses both the texts and pictures to craft his own bizarrely sensationalised versions of the each set of myths. In many cases, his version of the catasterismic myths seem to reflect a personal and, possibly, culturally-motivated animosity towards the behaviour of the gods and heroes of the pagan world;<sup>113</sup> and, in several cases, the illustrations in his manuscripts reflect what must be seen as either ignorance or intolerance of their Classical context.

<sup>111</sup> One must also remember that the earliest surviving illustrated version of the works in question postdate Michael's death by more than eighty years. The oldest illustrated version of the *Liber introductorius* is the Paduan manuscript, Munich, BSB, clm. 10268, datable to c. 1320 (cf.: BAUER 1983 (says c. 1340); ACKERMANN 2009 (c. 1320); BLUME/HAFFNER/METZGER 2016, II, 1, pp. 186-91 (1320-30); and the oldest manuscript containing an illustrated version of the *Liber de signis* is the north-Italian manuscript in St. Petersburg, which bears a date of 1348 (cf. ACKERMANN 2009, pp. 528-30 (c. 1350); BLUME/HAFFNER /METZGER 2016, II, 1, pp. 192-97 (third-quarter 14th-century, c. 1350?).

<sup>112</sup> *Insuper dicendum, quod predictae ymagines a multis recitantur fabulose, qualiter suam habent formam et unde originem habuerunt, et recitatur de illis in figura picturarum. Sed illarum fabulas in hoc libro non curamus, eo quod non sunt alicuius utilitatis* ('We should also mention that many people tell stories about the images mentioned, namely why they have their shapes and from where they originate, and that how they are also represented figuratively. We do not deal with these fables in this book, because they are of no use.'). Ed. ACKERMANN 2009, p. 126 (A 29).

<sup>113</sup> See the characterisation of Scot's myths as being focussed on 'rape and sexuality' in BLUME/ HAFFNER /METZGER 2016, II, 1, p. 31: '*Im Mittelpunkt stehen in seiner Fassung zumeist die Liebschaften, Vergewaltigungen und Sexualität, also Bereiche, die von der Astrologie und den Geistern in besonders starkem Maße beeinflusst wurden*'.



To take one example, Scot's description of Andromeda is typical of the way in which he distorts his sources.

*Andromeda fuit filia Cephei et Casiepie, que, cum esset pulcherrima iuuenis, dictum est a Iove, quod ipsa valde vexabatur libidine et quod tradatur Cetui ad devorandum. Que suspensa est ramis arborum quercus inter duos montes et hec inventa a Perseo liberata est. Quem amplexans, stricte nunquam voluit parentes videre nec alium virum, quam ille Argis conduxit letanter.*

*Et quia sic urebat intrinsecus, figuratus est femina desuper et masculus ab umbilico deorsum. Et hec mulier partim erat vestita et partim nuda pro facti significacione.<sup>114</sup>*

(Andromeda was a daughter of Cepheus and Cassiopeia. As she was a very beautiful girl, Jupiter said she was possessed by lust and ordered that she be thrown to a sea monster to be eaten. She was hung between two hills on the branches of an oak tree. Here she was found by Perseus, who freed her. She embraced him and then consistently refused to see her parents or any other man. He [Perseus] then joyfully brought her to Argos.

And because she suffered this internal torment, she is depicted as a woman in her upper part, and as a man from her navel downwards. And this woman was partly clothed and partly naked to mark this fact'.<sup>115</sup>)

With a stroke of his metaphorical pen, Michael Scot has managed to transform the beautiful Ethiopian princess, whose only crime is to have a vain and ambitious mother, into a tormented and lustful hermaphrodite.<sup>116</sup> The accom-

<sup>114</sup> ACKERMANN 2009, pp. 190-92.

<sup>115</sup> I have suggested elsewhere (cf.: LIPPINCOTT 1993, pp. 43-44) that this description of Andromeda as a hermaphrodite may come from clever philological manipulations between Greek and Latin. A similar suggestion has been made, possibly independently, in MARIANI CANOVA 2001, p. 396. I now wonder if it simply reflects a pictorial misreading of the knot holding her skirt just below her waist – a common feature of 2nd- and 3rd-century painted and sculptural depictions of standing female figures – as male genitalia.

<sup>116</sup> This suggestion is made in BLUME /HAFFNER /METZGER 2016, II, 1, pp. 37-38, who – perhaps over-generously in my view – characterise Scot's interpretations of the classical myths and their illustrations as evidence of his intelligent, reflective and 'quasi-scientific' approach to this material.

panying illustration of Andromeda depicts an apparently female figure, indecorously strung up between two trees, whose long skirt is parted to reveal male genitalia.

Trying to overcome one's prejudices in the assumptions one might make about what sort of illustrations might have been considered 'appropriate' by the supposedly enlightened book trade of 15th-century Venice, it remains difficult not to be baffled by Ratdolt's choice to use Michael Scot's figures as the basis for the illustrations to his edition of *De astronomia*. One possible explanation might be that Michael Scot's reputation amongst the academics in the university towns of Padua and Bologna was so high that using the illustrations from manuscripts of his texts would have been seen as acceptable. Another possibility, is that it could have been Ratdolt's original intention to print an illustrated version of Michael Scot's *Liber de signis* and that he had already commissioned a set of images based on the illustrations in a manuscript copy of the text, but he subsequently changed his mind when he realised that the market in Venice favoured classical authors.<sup>117</sup> Rather than commission a new set of drawings, it was more 'cost efficient' to use the Scot-derived pictures to illustrate the potentially more lucrative venture of an illustrated Hyginus. This suggestion sounds much more in keeping with the sorts of concerns that would inform the business decisions of a 15th-century printer, especially if he could take advantage of the fact that the text had already been edited by Carnerio in Ferrara few years earlier.<sup>118</sup>

Regardless of motive, however, the decision to use Scot-based images to illustrate the text of Hyginus generates two additional problems.

The first is that, even though the positions of the stars described by Scot closely resemble those listed in the *scholia Stroziana*, they are markedly different from those provided by Hyginus. For example, a comparison of the placement of the stars in Sagittarius shows:

<sup>117</sup> See BLUME /HAFFNER /METZGER 2016, II, 1, pp. 131-33.

<sup>118</sup> See pp. 30-31 above and the possibility that Santritter's edition could have been, despite his claims of editorial superiority and originality, largely based on Carnerio's text. As his tax records show, Ratdolt was one of the wealthiest men in Augsburg soon after his return to the city from Venice. See WEHMER 1955, p. 151 as cited by LANDAU/PARSHALL 1994, p. 180.

Hyginus, *De astronomia* <sup>119</sup>

...in capite stellas duas

in arcu duas

in sagitta unam

in dextro cubito unam

in manu priori unam

in ventre unam

inter scapilio duas

in cauda unam

in priori genu unam

in pede unam

in inferiori genu unam

in pollice (sic) unam.

Omnino est stellarum quindecim

Corona autem centauri est stellarum septem.

<sup>119</sup> As per Ratdolt 1482. In English, the text reads: 'He has 2 stars on his head, 2 on his bow, 1 on the arrow, 1 on the right elbow, 1 on the leading hand, 1 on the chest, 2 on the shoulder blades, 1 on the tail, 1 on the front knee and 1 on the foot, 1 on the hind knee, 1 on the thumb (sic). In total, there are 15 stars. There are also 7 in the crown of the Centaur'. The reference to the star in the thumb, reflects a mistaken reading as per Salutati's copy of Hyginus. See p. 30 above.

<sup>120</sup> See ACKERMANN 2009, p. 162. In English: 'Sagittarius has many stars, among which 19 are visible and are arranged as follows: there are 2 in the head, 2 in the bow, 2 in the wide (?) end of the arrow, 1 in the right elbow, 1 in his right hand, 1 nicely clear one in the belly of the steer, 2 in the spine of the back, 2 under the tail, 1 in each knee of the front feet. There are 7 under the legs, but they are small, which explains why they are rarely seen, and then only by someone who has particularly good eyesight for distant objects'. Incidentally, the stars listed do not total 19.

Michael Scot, *Liber de signis*<sup>120</sup>

in capite habet 2

in arcu 2

in latitudine acuminis sagitte 2

in dextro cubitu 1

in manu dextra 1

in ventre thauri (!) 1 bene claram

in spina dorsi 2

sub cauda 2

in quolibet genu pedum anteriorum 1

Sagittarius habet stellas multas, inter quas  
sunt 19 parisibilessub cruribus sunt 7, sed parve, quare raro  
videntur, et nisi qui habet  
subtilem visum et longinquum,  
nemo eas umquam videt.

Second, the illustrations that appear in Michael's Scot's manuscripts reflect a very different pictorial tradition from that found in a 'typical' 15-century Hyginus manuscript. As a result, the configurations of each constellation, as well as many of their attributes, have been significantly altered. The printer, therefore, was faced with the task of not only having to reposition that stars, but to place them within a figure that regularly has a totally different arrangement of limbs and accessories.

Nevertheless, if one compares the star positions in Ratdolt's figures with the descriptions in the accompanying Hyginian text – as well as with contemporary manuscript illustrations of Hyginus and those found in Michael Scot illustrations – it does seem that there has been an attempt to place the stars in accordance with the star lists of Hyginus, though this process has met with only limited success. To cite a few examples:

	Michael Scot	Hyginus, Book III	Ratdolt Hyginus image
Aries	3 stars in the nose 1 in each front foot	none in the nose 1 in the foremost foot	none in the nose 1 in the right foot
Bootes	4 in the right hand 1 on each knee	4 in the left (sic) hand none on the knees	none in the hands none on the knees
Hercules	1 in the sword ( <i>gladio</i> )	not mentioned	none in the club
Cepheus	7 on the sword's strap 1 on the right hip	not mentioned none on the hip	none on the strap none on the hip
Eridanus	17 stars on the man's body	no figure	none on the figure



The necessary repositioning of the stars raises some doubts over the otherwise attractive hypothesis made by Blume, Haffner and Metzger that Ratdolt previously had commissioned a series of blocks to illustrate an edition of Michael Scot and simply substituted these figures for his new edition of Hyginus. Given the technical realities of the relief-printing process, in which the uncut surfaces take the ink, the figures and their stars would have to have been cut at the same time – unless each star was subsequently and individually keyed-in to the pre-existing cut block. Possible, but unlikely. If, however, Ratdolt already possessed a series of Scot-based drawings, these could have been used as the basis for a set of blocks to which the Hyginian stars were added.<sup>121</sup> If so, then perhaps this was the ‘scientific’ aspect of the project that required Santritter’s particular skills and – according to Sentini’s testimony – kept him up all night. He may not have been kept busy watching the night sky, but one still should admire his stamina and inventiveness.

To modern eyes, the rough and ruralising ‘Germanic’ style of the illustrations in Ratdolt’s edition seems to be the very antithesis of a ‘Renaissance aesthetic’. Stylistic details – such as Bootes presented as a sickle-wielding peasant, King Cepheus wearing a linen coif and Auriga standing in a rough wooden cart drawn by 2 horses and two oxen, with a soft bycocket on his head – all seem to heighten the ‘alien’ nature of these images. If one then adds the fact that the pictures themselves are, essentially, non-sensical iconographic hybrids with no astronomical value whatsoever, it should raise questions as to whether or not our assumptions about what we believe to be the pervasive intellectual and cultural ambitions of the period are justified. We may find these illustrations are perplexingly inappropriate to the task; but, more importantly – and regardless of what we might feel – contemporary readers obviously did not find them inappropriate at all; or, perhaps it is more accurate to say that there is no evidence of contemporary readers having made attempts to correct or modify either the text or the illustrations in the marginalia found in existing copies of Ratdolt’s volume. Again, one is reminded of McKitterick’s warning not to make assumptions about the expectations of readers.

<sup>121</sup> My views on this process have changed slightly since my previous publication on this incunable (see LIPPINCOTT 2017, esp. p. 227), and are now slightly closer to those of Blume, Haffner and Metzger’s proposals – though I would still maintain that new blocks had to be cut specifically for the Hyginus edition to accommodate the ‘Hyginian’ locations for the stars.

In many ways, Ratdolt’s 1482 edition forms a suitable end to the curious history of the text and illustrations of the *De astronomia* – precisely because so many aspects of its composition are so unexpected. For, whereas generations of scribes and scholars were so intrigued by Hyginus’s detailed descriptions – which so clearly evoke some sort of illustrative counterpart – that they were motivated to search high and low for suitable pictorial models to copy or adapt for this purpose, none of their solutions seem to have lasted longer than a generation or two; and, in most cases, these ‘solutions’ tended to remain tied to a particular locale, as well – rarely travelling beyond the culturally-defined boundaries of Northern France, Southern Germany or the Humanist circles of Renaissance Italy.

But, against this history of well-intentioned false starts and for reasons that are not altogether clear to modern scholars, Ratdolt’s slightly quirky illustrations proved to be an immediate success. Beyond this, though, they went on to become the undisputed model upon which a large part of astronomical book illustration was based for the next forty years, transcending both national and cultural boundaries and becoming tremendously influential across the whole of Europe and beyond. One could argue that this instant popularity was due more to the power of the printing press than any inherent merits of the illustrations themselves; but, even today, the constellation illustrations in Ratdolt’s 1482 edition remain amongst the most widely recognised set of astronomical illustrations ever created.<sup>122</sup> Few who claim to ‘know’ them, however, will be familiar with the serendipity involved in their creation or understand fully the unexpected role that they play in the long and curious history of the text and illustrations of Hyginus’s *De astronomia*.

<sup>122</sup> For a discussion of the subsequent use and development of Ratdolt’s images, see LIPPINCOTT 2017, pp. 232-52. It is worth noting that the first significant change in the format of these well-worn images appears in the edition of Hyginus published by Sessa’s brother, Melchior, in September 1512. The text retains Sentini’s version and several of the pictures are based on a combination of figures taken from de Blavis and Johannes Baptista Sessa. There is, however, a subtle change in some of the figures in that they are now portrayed from the rear. This modification points to Melchior Sessa’s illustrator having used either a celestial globe or a depiction of a celestial globe as an inspiration.