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Manilius on the Nature of the Universe

A Study of the Natural-Philosophical Teaching of the *Astronomica*
with Select Commentary

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Table of Contents

Introduction.....	5
Chapter 1: The Universe of Manilius.....	13
1.1.The cosmology and mechanics of astrology before Manilius.....	15
1.2.Manilian cosmology.....	18
1.3.Determinism and fate.....	22
1.4.Heaven as the determiner of earthly events.....	24
1.5.The nature and mechanics of stellar influences.....	28
1.6.Theology.....	33
1.7.Traditional religion and myth.....	39
1.8.Fate and its ethical implications.....	45
1.9.The source(s) of the Manilian universal model.....	50
1.10.Conclusions.....	53
Chapter 2: Manilius in defence of astrology.....	55
2.1.Cicero's critique of astrology.....	56
2.2.Manilius' history of astrology: a programmatic rebuttal.....	73
Chapter 3: The response to Manilian astrology.....	81
3.1.Gellius' Favorinus and the provenance of his arguments.....	83
3.2.Favorinus' arguments.....	86
3.3.Conclusion.....	105
Chapter 4: Word and World in the <i>Astronomica</i>.....	107
4.1.The text as a model of the universe.....	108
4.2.Habituation through metaphor.....	121
4.3.Paradox and polyptoton.....	124
Chapter 5: Manilius on the nature of the universe.....	129
5.1.What the <i>Astronomica</i> promises its reader.....	130
5.2.A survey of the <i>Astronomica</i> 's technical lessons.....	134
5.3.Unfulfilled promises.....	150
5.4.What do we learn about the poem's imagined reader and target audience?.....	159
5.5.Manilius, Rome and Empire.....	160
5.6.Conclusion.....	168
Chapter 6: An Epilogue.....	169
Commentaries:	
118-252: The form and nature of the universe.....	172
122-148: Six views on the origin of the cosmos and its smallest constituent parts.....	175
149-172: The creation of the universe.....	185
173-246: The position and shape of the earth within the universe.....	194
255-371: The Night Sky – The Northern Constellations.....	232
255-262: Introduction.....	232
263-274: The twelve signs of the zodiac.....	236
275-293: The axis of the universe.....	241
294-371: The northern constellations.....	248
758-804: Manilius on the True Nature of the Milky Way.....	284
Appendix: Manilius and the Early History of Star Charts.....	309
Bibliography and Abbreviations.....	327

Introduction

Among the few astrological texts to survive from antiquity, the *Astronomica* is unique in one especially fascinating way – one that has, as far I have been able to tell, eluded the notice of its readers. The bulk of any astrological manual will inevitably consist of sets of correspondences between what goes on up in the heavens and what happens, consequently or concomitantly, down on earth. This information is, on the whole, relayed serially in bare catalogue form with little elaboration or rationale.¹ In the case of an author such as Dorotheus of Sidon, whose work has reached us only through an Arabic translation, the apparently dry delivery of the technical material may owe more to the translator than the poet.² However, even in Pseudo-Manetho's *Apotelesmatica*, an imperial-period compilation of astrological poetry whose earliest parts belong to the second century,³ correspondences between earthly and heavenly events are presented to the reader without any explaining *why* each arrangement of the heavens is paired with its earthly event. We can look only to the memorable charm of the verse to help the information stick in our minds. Manilius, in contrast, seizes every opportunity he gets to show us that the fine detail of his astrology *makes sense*, and that there is a good, comprehensible reason behind every aspect of his system.⁴ It is an argument that takes the entire poem to unfold, as

1 The habit, so common in astrological manuals, of presenting technical material in a hard-to-digest, and often unclearly structured, manner leads some to suspect that it is part of a deliberate strategy to confuse the reader: see Barton 1994, 71-94.

2 Dorotheus himself appears to have written between AD 25 and 75: see Pingree 1976, x.

3 A rough date for the books can be deduced from the author's own horoscope at 3.738-50, which reveals a date of birth of AD 80: see Neugebauer and van Hoesen 1959, 92.

4 I offer here two examples, with more following in Chapter 5: Aries, the first sign in the zodiac, bears the astrological relation called 'listening' only to himself since, as is fitting for a leader, he is his own advisor (2.485). That some of the zodiac's signs appear to be missing limbs serves to teach us to bear loss with a

Introduction

Manilius takes us on a tour first of the cosmos (Book 1) and then of various branches of astrological teaching (Books 2-5).

The great, and protracted, efforts of Manilius to reveal a meaningful pattern behind the mass of information that makes up the body of astrological teaching point to a seriousness of purpose that recent scholarship has rarely acknowledged in the *Astronomica*.⁵ The poem may leave us none the wiser as to how to *do* astrology, but it does all it can to turn us into believers. It is a poem with a serious astrological mission, and serves as a vindication of the science at least as much as it does an introduction to it.

This thesis springs ultimately from the discovery of this unique feature of the *Astronomica*. Exploring the rest of Manilius' universe, it finds the same message recurring throughout: everything in his world has its reason and makes sense, both on its own and as a part of the whole. It reveals an impressive internal consistency to the model of the universe presented in the poem – what it is and how it works – and finds that model to be the painstaking creation of the poet himself. Recognising the level of care invested in the development of this universe, the thesis explores the manner in which Manilius communicates his natural philosophy through his poetry, and finds several sophisticated teaching strategies at work. Altogether the findings suggest a much more serious didactic purpose to the *Astronomica* than has generally been seen in the work.

At the same time, however, the *Astronomica* fails to teach us even the rudiments of astrological practice, not just by omission of vital details but also through basic error. How can we reconcile these two very different sides of the work, its meticulously crafted and

stiff upper lip (*exemploque docet patienter damna subire*, 2.262).

5 Volk's comparison of the poem to a 'coffee-table book' (Volk 2009, 181f.), into which the reader can dip for enjoyment or erudition, does little justice to this strategy of argument through accumulation of examples.

presented world-view on the one hand and its downright inept practical instruction on the other? The thesis ventures the opinion that the natural-philosophical teaching of the *Astronomica* was the principal concern of its author, and the technical astrological material just a vessel for his extended proof that every detail in the workings of fate has its reason. It therefore has much in common with its great predecessor in the Latin didactic tradition, Lucretius' *De rerum natura* (henceforth *DRN*): though that poem is at first sight primarily an exposition of Epicurean physics, it becomes clear that its principal concern is ethical, steering its reader away from superstition, the fear of death and other damaging thought-patterns. On my reading, the *Astronomica* is just as much a poem 'on the nature of the universe', and it is from that observation that the thesis takes its title.

Interest in Manilius has grown hugely in recent years, with an effusion of scholarship especially in the last decade, spearheaded by Katharina Volk's *Manilius and his Intellectual Background* (Oxford, 2009). This excellent book offers a clear appraisal and decent synthesis of earlier research into the poem, and does much to reveal the breadth and complexity of the ideas informing the text. Where I feel it falls short, however, is in its keenness to find 'self-contradictions' in the *Astronomica* and its world-view – almost always in remarks which, had they appeared in Lucretius, would be recognised as figurative.⁶ Recent Lucretian scholarship has, as a rule, approached the *DRN* from a more charitable angle, starting from an assumption that it is a carefully thought-out, philosophically serious piece of didactic literature.⁷ This approach has revealed great

6 Some valuable challenges have already been made against this approach: see the contributions of Henderson 2011 and Mann 2011.

7 This is indeed the standard modern approach to the poem. Notable examples of studies coming from this standpoint are Clay 1983, Sedley 1998 and the various papers in Algra 1997 and Gale 2007.

Introduction

sophistication in Lucretius' teaching strategies, such as his uses of analogy and appeals to domains of experience familiar to his reader. When applied to the work's somewhat perplexing conclusion and instances of large-scale verbatim repetition, it has often yielded richer interpretations than those that treat such oddities as only marks of the work's unfinished nature. Taking a cue from Lucretian scholarship, this thesis sets out to see what happens when this more charitable approach is applied to Manilius, and finds a compelling result – that it is, in fact, a rather successful piece of natural-philosophical teaching.

At the same time, however, it finds new truth in the conventional assumption that Manilius is first and foremost an advocate of astrology: it reveals his efforts to defend astrology at all costs, uncovers strategies for making the reader more amenable for further astrological study and practice, and contends that someone with Manilius' set of beliefs must first have been a devotee of astrology before embracing a natural-philosophical perspective such as his.

One of the most fruitful developments in recent scholarship on didactic literature generally are the distinctions, now generally made, between a work's actual author and its authorial voice (called variously the 'narrator' or 'teacher-figure'), and between the actual reader and the persona of the implied 'Reader' (or 'addressee' or 'student-figure')⁸ that emerges from the text itself. The distinctions help us avoid naïve assumptions about the aims of the authors themselves (the so-called 'intentional fallacy'⁹), and allow a richer appreciation of the texts, recognising in them as a dramatic exchange between two fictional characters.¹⁰ The most recent long studies of the *Astronomica*, particularly Green

8 See Volk 2002 *passim*. For the terminology of reader versus 'Reader', see Sharrock 1994.

9 The term owes its origin to Wimsatt and Beardsley 1946.

10 The idea of didactic poetry as a dramatic dialogue begins with Volk 2002.

2014 and Volk 2009, have profited immensely from these distinctions, recognising a telling dissonance between the ambitions of the author himself and those of his teacher-figure. There is, however, a real danger in fulling abandoning what we might call the 'naïve' approach to didactic literature – that is, treating the voice of a text as that of the actual author. As this thesis finds, so much care has been invested in developing the *Astronomica's* unique and innovative natural philosophy, and in exploiting the full arsenal of teaching techniques offered by the tradition of didactic poetry, that the simplest explanation is to see it as a serious piece of philosophical teaching, not just a literary game.¹¹ It is no accident that the scholarship on the *DRN*, a text whose philosophical ambitions are generally taken more seriously, is rather more willing to speak of Lucretius' aims *as its author*, rather than limiting itself to the fiction of the teacher-student relationship that emerges from the poem. This thesis aims to see what happens if, as often as is plausible, we take the words of the *Astronomica's* teacher-figure as those of the author and presume that the teaching that the implied student-figure walks away with is also no more or less than what it wants us – the actual readers – to take from it. The *Astronomica* has often infuriated readers who approach it in this 'naïve' manner, the most famous, and most articulately dismissive, of whom is A. E. Housman.¹² Taking a more charitable approach to the poem, this thesis finds a way to reconcile its shortcomings with the idea of a serious philosophical goal.

The thesis is divided into chapters and commentaries, which pursue the aims presented

11 The best studies recognise at least some slippage between a fictional exchange with the implied 'Reader' and direct engagement with us, the actual readers (see Green 2014, 15).

12 For him Manilius excels only in 'doing sums in verse': Housman 1903, xxi. On Housman himself and his attitude to Manilius see Gow 1936, 13.

Introduction

above in two different but complementary ways.

Chapter 1 presents a comprehensive survey of the evidence for the cosmology, physics and theology of the *Astronomica*, and discovers that a coherent and carefully thought-out world-view underlies the poem. It suggests that this Stoicising world-view is drawn exclusively from a few philosophical works of Cicero, but is nonetheless the product of careful synthesis.

Chapter 2 explores the relationship between this world-view and earlier Academic criticism of astrology and concludes that the former has been developed as a direct response to these criticisms, specifically as set out in Cicero's *De divinatione*.

Chapter 3 examines the later impact of Manilius' astrological world-view, as far as it can be detected, assessing the evidence for the early reception of his poem and its role in the history of philosophical astrology. The overwhelming impression is that the work was received as a serious contribution to debate over the physical and theological underpinnings of astrology; its world-view was absorbed into the mainstream of astrological theory and directly targeted in the next wave of Academic criticism of astrology.

Chapter 4 looks at the more subtle strategies of persuasion that are at work in the *Astronomica*. It observes, first, a number of structural devices and word-patternings that set up the poem as a model of the universe it describes. This first part of the chapter concludes by asking what didactic and/or philosophical purpose such modelling could serve. The second part examines how, by a gradual process of habituation-through-metaphor, the reader is made familiar with the conventional astrological way of thinking about the world, which might otherwise have struck him as a baffling mass of

contradictions. The third part looks at the use of certain rhetorical figures, particularly paradox, to re-emphasise important physical claims and assist the process of habituation.

Chapter 5 takes on the task of making sense of the *Astronomica* as a whole, seeking out an underlying rationale behind the choice and ordering of material, accounting as well as is possible for its apparently premature end, and asking why, if it is a serious piece of natural-philosophical teaching, it so often appears to be self-undermining.

A short epilogue asks what path can have led Manilius to embark on such a work as the *Astronomica*. It offers a sketch of the author as an adherent (but not a practitioner) of astrology, who had developed a philosophical system first as scaffolding for an art under threat, but had then come to see more importance in that philosophical underpinning than in the activities of prediction.

The lemmatised commentaries that follow cover several passages from the first book of the *Astronomica*. As crucial as the remaining four books are to his natural-philosophical teaching, it is in this part of the poem that Manilius concentrates the direct expositions of his world-view. Like the chapters, the commentaries' two concerns are the nature and the exposition of the work's world-view. Each of the commentaries has its own focus, but all make full use of the format to tease out the poet's teaching strategies and watch his techniques operate 'in real time' over protracted stretches of text.

Finally, an appendix presents the case for the *Astronomica* as the earliest evidence for the use of plane-image star maps. At two points in his tour of the night sky Manilius describes the positions of constellations in a way that suggests that he is consulting a flat projection of each hemisphere, and that he is assuming his reader has one to hand, too. This observation casts valuable new light on the history of celestial cartography.

Introduction

Chapter 1: The Universe of Manilius

The *Astronomica* offers a model of the universe that has much in common with established philosophical traditions, and most markedly Stoicism.¹ Closer inspection reveals the great extent of its idiosyncrasy, not just in its eclecticism – a feature already recognised in the scholarship² – but also in the form of various innovations, and the great pains of its author to paint a consistent picture of the universe. The following survey finds that the poem's world-view has been specifically tailored to endow astrology with the greatest possible degree of plausibility. Since the work's explicit aim is to promote the study of that science, this is not wholly surprising. What is more remarkable is that the world-view has not been borrowed wholesale from its astrological source-material, but has been painstakingly pieced together by the poet himself.

With its deliberately charitable reading of Manilius, it may come as no surprise that the survey presents a highly consistent world-view. However, I hope the reader will agree that the charity is rarely, if ever, misplaced, and the resulting account of Manilius' methods is a persuasive one. The level of care invested in constructing the world-view, besides, will reveal the extent of the author's ambitions as a philosopher. The reader must be warned at this point that the *Astronomica* does not entirely live up to its ambitions of an all-encompassing philosophical system – in particular, too little thought has been given, it seems, to the ethical implications of his determinism (see Section 1.8 below) – the inquiry can still cast valuable light on the ways in which various, mostly Hellenistic, ideas were

1 For the groundwork in the study of Stoic elements in Manilius, see Lühr 1969 and Reeh 1973. Volk (2009, 226-234), though recognising the clear overlaps with Stoicism, rejects the idea of Manilius as a flag-flying Stoic, arguing that many of the overlapping beliefs belonged simply to the 'mainstream' of the day.

2 See Salemme 2000, 9-45 and Volk 2009, 226-251.

received in the first-century Roman Empire.

Any survey of this kind must take care to avoid two methodological hazards. Firstly, the work's evident debt to Stoicism presents a great temptation to brand Manilius as an adherent of that school, and then to assume that he falls in line with the Stoics on matters not discussed in the *Astronomica*. Equally dangerous, and for the same reason, is the assumption that because Manilius is an astrological author his understanding of, say, the mechanics of stellar influence is no different from that attributed to astrologers in other early astrological sources. To avoid repeating the mistake, I present Manilius' world-view in full before deliberating on its debts to earlier thought. This method may appear perverse whenever that debt is blatant, but it should make it easier to appraise his universe's consistency. Points of contact with the philosophical traditions are therefore consigned to footnotes as far as possible.

The second hazard arises from the poetic tradition to which the *Astronomica* belongs, in particular from Manilius' imitation of Lucretius. The *DRN* includes many statements that, taken at face value, are in direct contradiction to the poem's principal claims, leaving it up to the reader to reflect on the inconsistency and come to recognise the originally puzzling statement as merely figurative. Lucretius' atoms really have no will of their own, but he makes them (for instance) fight and make alliances between each other to illustrate the manners in which atoms really behave; and though he does not believe in the conventional Roman gods, Lucretius readily uses their names as metonymies for various real-world phenomena.³ Manilius puts figurative language to similar uses, often

3 The scholarship on this aspect of Lucretius is vast. See especially West 1969 and now Johncock 2015.

also from the domain of conventional religion. Many instances are evidently figurative (wherever what is said is in flagrant contradiction to the poem's fundamental physical claims), but not all are so clear-cut. In the following survey, the interpretation of such passages is guided by the assumption that Manilius would not employ such a tactic without also providing the student with the means to recognise the figurative expression as figurative. This seems reasonable on the grounds that it holds good of Lucretius, Manilius' model. Still, this hazard will naturally be harder to avoid and some room will remain for controversy.

1.1. The cosmology and mechanics of astrology before Manilius

As a reference-point for the following discussion, it will be valuable to have an idea of how astrologers before Manilius believed the universe worked, allowing us to observe any innovation in the system presented in the *Astronomica*. The evidence for earlier astrology is comparatively scarce, and since none of it has come down to us in a contemporary astrologer's own words, the picture it offers may be flawed in ways we cannot divine. That picture is nonetheless cohesive enough to give it a certain plausibility, and has enough in common with later evidence to suggest that it is at least broadly accurate.

The earliest and most detailed description of the workings of astrology is given by Cicero in the *De divinatione* (2.89), directly before an extended attempt to refute the discipline's claims.⁴

4 On this attempt, see Chapter 2.

The Universe of Manilius

In the starry belt which the Greeks call the Zodiac there is a certain force (*vim*) of such a nature that every part of that belt affects and changes the heavens (*moveat immutetque caelum*) in a different way, according to the stars that are in this or in an adjoining locality at a given time. This force is variously affected (*moveri*) by those stars which are called 'planets' or 'wandering' stars. But when they have come into that sign of the Zodiac under which someone is born, or into a sign having some connection (*coniunctum*) or agreement (*consentiens*) with the natal sign, they form what is called a 'triangle' or 'square'. Now since, through the procession and retrogression of the stars (*accessu stellarum et recessu*), the great variety and change of the seasons and of temperature take place, and since the power of the sun produces such results as are before our eyes, they believe that it is not merely probable, but certain, that just as the temperature of the air is regulated, so also children at their birth are given life and physical form (*animari atque formari*) and by this force their characters (*ingenia*), manners (*mores*), mind (*animus*), physical condition (*corpus*), career in life (*actionem vitae*) and destinies (*eventus*) are given shape (*fini*).

(tr. adapted from Rackham 1933).

Though there is some possible confusion on more technical points,⁵ this coherent and plausible sketch offers a vital insight. The core belief presented is that a force, located in the zodiac, comes down to earth and determines the character and destiny of each child at its birth, in the same way that the sun's force determines the air's temperature. That force is modified (literally 'moved, shifted') by the planets according to their position, and by various relationships between the zodiac's signs. Just as the effects of the sun's force differ according to the positions of the heavenly bodies (in other words, depending on the seasons), so different configurations of the heavenly bodies bestow different characters and destinies upon mortals. Note that the analogy alone does not entail any commitment to belief in cosmic sympathy – that is, a belief in some sort of affinity between the universe's

5 So Long 1982: 172, pointing out that *consentiens* (perhaps a calque of *sumphōnoi*) is not suitable of signs forming squares, which other sources agree to be hostile to each other (*asumphōnoi*). I do not think that the error or oversight does much discredit to Cicero, who communicates nonetheless effectively that the different signs of the zodiac interrelate in established ways and, through the planets, affect each other's influences.

1.1. *The cosmology and mechanics of astrology before Manilius*

parts.⁶ In fact, the language of forces tells against such an interpretation: the astrologers of Cicero's day, like many of their successors, believed that the heavens acted directly upon mortals through unseen forces. Nor is any clear commitment expressed to full determinism, only partial.

Other sources shed light on points of early astrological cosmology and theology. Diodorus Siculus, in his ethnographic portrait of the Chaldaeans⁷ of Babylon, describes their understanding of the universe thus (2.30):

Now, as the Chaldaeans say, the world (τὴν...τοῦ κόσμου φύσιν) is by its nature eternal, and neither had a first beginning nor will at a later time suffer destruction; furthermore, both the disposition and the orderly arrangement of the universe have come about by virtue of a divine providence (θεία τιὼ πρόνοια), and today whatever takes place in the heavens is in every instance brought to pass, not at haphazard nor by virtue of any spontaneous action, but by some fixed and firmly determined divine decision (tr. Oldfather 1933).⁸

Seneca attributes another, and not necessarily incompatible, cosmological belief to the third-century BC astrologer Berossus: he supposedly claimed that the earth would periodically be destroyed and renewed through floods and conflagrations, the former occurring whenever the planets are aligned in the sign of Cancer and the latter when they are aligned in Capricorn (*NQ* 3.29.1). How widely any of these beliefs were shared among early astrologers, or how much debate was given to such subjects from within the astrological tradition is, however, impossible to tell.

6 For the Stoic belief, see Cic. *ND* 2.19.

7 The term is used in ancient texts both as a demonym and also as a way to denote astrologers of any extraction.

8 The passage contains some markedly Stoic vocabulary (*diakosmesis*, *pronoia*). Whether Diodorus is drawing on Stoic terms to describe features he recognises as analogous, or whether the astrology he is describing was itself Stoicising, cannot be known.

1.2. Manilian cosmology

Manilius makes room early in his poem for a long cosmological primer (1.118-254), introducing his student to the shape and nature of his universe.⁹ After expressing uncertainty as to the very origin of the universe, Manilius offers a brief narrative of its earliest stages of existence that doubles up rather cleverly as a sketch of the universe's basic structure (1.149-166). It is made up of four elements, each of which arrived in turn at its place in the structure: at the top is fire, which occupies the outermost layer of the universe (the *aether*) and makes up the heavenly bodies; below it is the air, and below that the water and earth which, by a process of filtering and draining, have each come to cover different parts of the Earth's surface. The result is a sphere of several layers, which maintains its overall structure with the Earth at 'the centre and bottom of all' (170) since the heavier elements press evenly towards the universe's centre and the lighter ones, with the same evenness, strive to move away from it (168-170).

The reasons for Manilius' reluctance to commit to any one view of the absolute beginning of the universe are discussed in Section 1.4 below. However, his true opinion on the question is revealed in a parallel narrative of the cosmogony in the prologue to Book 3 (3.47-66). There, the world is presented as the handiwork of a divine Nature, whom he calls 'the beginning of the universe' (*principium rerum*, 47). The second cosmogony completes another picture that had been roughly sketched in the first – that of the interrelation of the four kinds of matter. The elements are described as 'feeding' each

⁹ See commentary ad loc. What follows here is merely a summary of the main points.

1.2. Manilian cosmology

other, with some of each kind always transforming into matter of a neighbouring kind.¹⁰ By this process of transformation, Nature has bestowed a certain concord and stability upon the universe:

diversaque membra
ordinibus certis sociaret corpus in unum,
aeraque et terras flammamque undamque natantem
mutua in alternum praebere alimenta iuberet,
ut tot pugnantis regeret concordia causas
staretque alterno religatus foedere mundus

‘By fixed laws she (Nature) united separate limbs into a single body, ordaining that air and earth and fire and flowing water should each for the other provide mutual sustenance, in order that harmony might prevail over so many elements at variance¹¹ and the universe stand firm in the bonds of a reciprocal foundation.’ (3.50-55; tr. Goold)¹²

The use of the word ‘limbs’ (*membra*) for the elements is one of the *Astronomica*’s central metaphors, and reflects Manilius’ understanding of the universe as a living, rational organism. Directing the whole, in the manner of a human mind,¹³ is a divine force (*vis...divina*, 1.250) which Manilius also calls, among other things, ‘God’ (*deus*, 1.251) or spirit (*spritus*, 2.64).¹⁴ He rounds off the cosmological primer of Book 1 with a reflection

10 It is tempting to call the four not ‘elements’ but ‘states of matter’, given these transformations. This, however, would be misleading, since it seems that for Manilius objects can be made up of different elements in combination: in his passage on comets, he tells us that there is fire mixed into all of the universe’s parts (*sunt autem cunctis permixti partibus ignes*, 1.852).

11 Presumably, the elements are thought to be at variance since they possess the opposing qualities hot, cold, wet and dry – a subject touched upon in Manilius’ summary of the Empedoclean view of matter (1.141f.).

12 Unless otherwise indicated, translations of Manilius are my own. Those attributed to Goold are drawn from Goold 1977.

13 The analogy is made, albeit the other way around, at 4.888-890.

14 God, it becomes clear, is also equivalent to the personified Nature presented as the agent of creation in the prologue to Book 3. On this and other equivalences see Section 1.6 below.

The Universe of Manilius

upon the role of God in maintaining and governing the universal organism, a passage of very similar character to the one just considered:

hoc opus immensi constructum corpore mundi
membraque naturae diversa condita forma
aeris atque ignis, terrae pelagique iacentis,
vis animae divina regit, sacroque meatu
conspirat deus et tacita ratione gubernat
mutuaque in cunctas dispensat foedera partes,
altera ut alterius vires faciatque feratque
summaque per varias maneat cognata figuras.

'This fabric which forms the body of the boundless universe, together with its members (*membra*) composed of nature's divers elements, air and fire, earth and level sea, is ruled by the force of a divine spirit; by sacred dispensation the deity brings harmony and governs with hidden purpose, arranging mutual bonds between all parts, so that each may furnish and receive another's strength and that the whole may stand fast in kinship despite its variety of forms.' (1.247-252; tr. Goold)

In a third passage of like character, this time from the prologue of Book 2, Manilius reveals that the divine spirit not only governs the universe but is immanent in it, pervading all its parts (2.60-66):

namque canam tacita naturae mente potentem
infusumque deum caelo terrisque fretoque
ingentem aequali moderantem foedere molem,
totumque alterno consensu vivere mundum
et rationis agi motu, cum spiritus unus
per cunctas habitet partes atque irriget orbem

1.2. Manilian cosmology

omnia pervolitans corpusque animale figuret.

'For I shall sing of God, silent-minded monarch of nature, who, permeating sky and land and sea, controls with uniform compact the mighty structure; how the entire universe is alive in the mutual concord of its elements and is driven by the pulse of reason (*ratio*), since a single spirit (*spiritus*) dwells in¹⁵ all its parts and, speeding through all things, nourishes the world and shapes it like a living creature.' (tr. Goold).

The divine spirit may extend throughout the universe, but it is found in its greatest concentration up in the heavens. This is revealed in the prologue to Book 1, where Manilius tells how mankind is invited to gaze upon the heavens so that 'the peoples might discern God where he is at his greatest (*sentirent...deum gentes qua maximus esset*, 1.39). The heavens are, of course, made of the element fire; and since Manilius tells us elsewhere that fire is found mixed in amidst all the universe's matter,¹⁶ it is tempting to identify his divine force with fire, although at no point is this clearly stated. God is, however, identified explicitly with the entire universe (*mundum...ipsum esse deum*, 1.484f.),¹⁷ a detail that in a sense supports God's equivalence with fire since, in the first cosmogony-narrative, fire was shown to be the origin of all other matter (1.149-159).¹⁸

An important corollary of God's all-pervading immanence is that the whole universe is 'driven by the motion of *reason*' (*rationis agi motu* 2.64).¹⁹ The result of this is that everything that happens in the universe can be seen to make sense, and everything in the world has an identifiable purpose or function:

15 The idea that God 'dwells in' the universe recurs at 4.890, where the universe is referred to as its *hospitium* ('lodging' or 'place for it to stay').

16 1.852.

17 The context reveals that *mundus* here must be meant in the sense 'world' rather than 'sky'.

18 See comm. ad loc.

19 Reason, for Manilius, is yet another equivalent of God: see Section 1.6 below.

The Universe of Manilius

nec quicquam rationis eget frustrave creatum

'There is not a thing that lacks reason or has been created in vain' (2.235)

This underlying principle of the universe – that everything makes sense – informs every part of the *Astronomica*. In fact, the poem as a whole can comfortably be read as constituting a proof of the principle.²⁰ It can be seen, for instance, in the constant provision of rationales even for small-scale details of astrological doctrine in Books 2-5. The principle that 'nothing has been created in vain' can also be seen in Manilius' keenness to account for celestial phenomena that do not typically fall within the astrologer's purview, such as the Milky Way (1.684-804) and comets (1.809-926).

1.3. Determinism and fate

As well as maintaining the structure of the universe, the divine force fulfils two roles that are crucial to guaranteeing the possibility of astrology. The first – that of inspiring mankind to undertake the necessary celestial research – is discussed in Section 1.6 below. The other role is to ensure that the universe throughout its parts moves in a regular and predictable way. The divine will, in this capacity, is frequently referred to as fate (*fatum/fata, sors*) or personified Fortune (*Fortuna*); it indulges in no changes of mind, and by guaranteeing that the universe moves according to fixed laws has made the entire course of history predictable from observation. Manilius, in short, believes in full determinism, an issue he explores at length in the prologue to Book 4:

20 See Chapter 5.

1.3.Determinism and fate

fata regunt orbem, certa stant omnia lege
longaque per certos signantur tempora casus.
nascentes morimur, finisque ab origine pendet.

'Fate rules the world, all things stand fixed by its immutable laws, and the long ages are assigned a predestined course of events. At birth our death is sealed, and our end is consequent upon our beginning.' (4.14-16; tr. Goold)

An individual's fate, he says, can in no way be changed (4.17-22). Before ending his prologue, Manilius offers an apt illustration, pointing out that he, too, was fated to dwell as he has done upon the nature of fate (4.118).

A fully deterministic universe, however, is not necessarily one in which astrology is possible. If nothing ever happens twice, then we can never put our observational data to predictive use. Fortunately for mankind, God has constructed the universe in such a way that certain matter can be seen to move in fixed cycles of a short enough duration for man to observe. That matter makes up the heavenly bodies, from whose observation it is possible to discover the future. The regularity of their motion is naturally of vital importance for the validity of astrology, and forms a central preoccupation of Manilius' first book (see especially 1.182-193, 474-531). The cosmological primer sets out to prove this early in the book (182-193), along with other points of equal importance to the validity of astrology: that the earth is round (206-234) and remains poised at the very centre of the universe, with the heavenly bodies in constant orbit around it (173-193). Were any of these to be false, it would call into question the reliability of observation of the heavens from earth.

Confusingly, perhaps, we have seen two things in Manilius' universe that serve to maintain its structure and the regularity of its movements, only one of which would have sufficed for the purpose: the all-pervading immanence of the divine and the mutual 'feeding' of the elements (1.247-252, 3.50-55). If Diodorus can be trusted,²¹ the former was already seen by astrologers as making their trade possible. Why, then, has a second guarantee been added to the scheme? It is possible that the Stoicising Manilius has taken on the doctrine of elemental exchange unquestioningly along with other aspects of the school's physical theory. This seems out of step, however, with his selectivity in other respects, not to mention the clear importance he places on elemental theory in the passages just cited. In Section 1.5 below, we will see that the elemental theory plays a separate, important role of its own in the *Astronomica*, in explaining how the heavens come to influence things on earth.

1.4. Heaven as the determiner of earthly events

In a fully deterministic, interconnected world such as Manilius', one should be able, given enough information about the conformation and state of matter at any one point, to predict any subsequent event. Since he asserts that the movements of the heavenly bodies are entirely regular, the same must be true of all matter within his universe. There can be no movement of matter within the universe without some corresponding movement elsewhere, and so, at least in principle, prediction should be possible not only based on observation of the heavens but on observation of any matter's movement, so long as it is

21 See Section 1.1 above.

1.4. Heaven as the determiner of earthly events

correctly interpreted. Such is the nature of a fully mechanical universe in which the regularity of one part's motion is guaranteed.

Why, then, does Manilius single out the stars as the object of his study, and not give equal attention to all forms of divination? It is not enough to say that the divine force is most concentrated in the heavens, since that alone would not lend any more likelihood of success to predictions based on their observation than on observation of, say, a rooster pecking at grain. Nor did this belief make the Stoics, who shared it,²² any more committed to astrology than to other forms of divination.²³ The true reason, I suspect, is that Manilius is first and foremost an astrologer, whose commitment to the discipline predates and inspires his belief in a fully deterministic universe. It is for this reason that he is so eager to give precedence to his science over other forms of divination such as augury and haruspicy, making this the last and greatest triumph of natural philosophy in his history of civilisation (1.96-112; cf. 4.911-914). I suspect that the entire cosmology of the *Astronomica* is a back-formation, specifically engineered to guarantee the viability of astrology.

From its outset, the poem is full of statements ascribing causal powers to the stars. It is not immediately obvious, however, how this reverence for the causal powers of the stars can be reconciled with his belief in a fully deterministic universe. For in such a universe, the assigning of responsibility for any one event is almost trivial, since its cause is merely the effect of another cause in an unbroken chain going back to the universe's beginning. In placing so much emphasis on the powers of the stars, the determinist

²² Cic. *ND* 2.29f.

²³ See Long 1982, Jones 2003 and MacGregor 2005.

The Universe of Manilius

Manilius is at risk of ‘having his cake and eating it too’, to borrow Volk’s phrase.²⁴ However, he deftly absolves himself of such a charge by including his narrative of the cosmogony at 1.149-166. In it, the first movement described is that of the element fire, which rises up to the upper reaches of the universe and forms the sphere of heavenly bodies (149-151). The causes of every subsequent event can, then, be traced back to the movement of the heavenly bodies at a point in time at which no other matter had yet taken form. The heavens for Manilius therefore have ultimate causal responsibility for everything that happens. This may explain, also, why the absolute beginnings of the universe are left a mystery at 1.145f.: it is only revealed later that Nature (that is, the divine force) is the true *parens mundi* (2.209) and *principium rerum* (3.47). But since his reader cannot yet know that for him the divine force and the heavenly bodies can to a great extent be equated,²⁵ it makes best sense to present the celestial fire as the prime mover at this stage.

This accounts for the heavenly bodies’ ultimate responsibility for events on earth. It alone, however, does not explain the priority given to the signs of the zodiac in particular: for although many of the extrazodiacal constellations are given astrological importance in the *paranatellonta*²⁶ of Book 5, it is the zodiac that has the most critical role. Again, the ultimate reason is that Manilius is working within an astrological tradition which, as the Cicero passage above reveals, already gave pride of place to the zodiac. What is really interesting is how he integrates this privileged status into his novel physical framework.

The explanation comes in the second of Manilius’ two cosmogony-narratives (3.47-66),

24 Volk 2009, 13.

25 Cf. Cic. *ND* 2.39.

26 That is, lists of effects associated with constellations rising simultaneously with specific degrees of the zodiac.

1.4. Heaven as the determiner of earthly events

which adds detail to the sketch offered in the first:

quae, quasi, per mediam, mundi praecordia, partem
disposita, obtineant, Phoebum lunamque vagasque
evincunt stellas nec non vincuntur et ipsa,
his regimen Natura dedit, propriasque sacravit
unicuique vices sanxitque per omnia summam,
undique uti fati ratio traheretur in unum. (2.61-66)

‘And to those stars (i.e. those of the zodiac) which, deployed about the central region, occupy the heart of the universe, as it were, and which outfly the Sun and Moon and planets and are also themselves outflown,²⁷ to these Nature gave dominion: to each sign she devoted individual associations, and fixed in the zodiac for ever the total distribution, so that the influences upon destiny might be drawn from all quarters and concentrated into a single whole.’ (tr. Goold).

That the future can be deduced from observation of the zodiac is not, therefore, just a convenient consequence of Manilius’ deterministic world-view. It is part of Nature’s grand universal design: she has given them *regimen* (the power to govern), so that the scheme of fate (*fati ratio*) may be drawn from everywhere else (*undique*) into a single place. We need not be surprised, then, that the stars of the zodiac have a disproportionate level of influence: Nature has so arranged it that the other stars have bestowed their powers on the zodiac as a greater authority, allowing us to deduce the future from the zodiac region alone.

27 Owing, that is, to the alternately retrograde and prograde motion of the planets as perceived from the Earth.

1.5. The nature and mechanics of stellar influences

The picture so far given of the heavens as causally responsible for events on earth leaves an important puzzle unexplained – namely, the character of the language Manilius so often uses when describing the stars’ effects. In a deterministic universe in which the stars are essentially the prime movers, it makes sense to speak of them as ‘ruling’ or ‘dominating’ the earth, or even ‘generating’ the living beings that inhabit it (1.18). Harder to explain are descriptions of signs sending down, giving and receiving powers (*vires*), and exerting influences (*effectus*), either upon the earth or upon each other. Elsewhere, Manilius speaks of signs’ ‘vision’ (*visus*) affecting the atmosphere (2.355-357).²⁸ Such language is very typical of astrology as attested in other sources, including the passage of Cicero printed in section 1.1 above, where a force (*vis*) is said to move and change heaven (*moveat immutetque caelum*). In Manilius’ deterministic universe the idea of signs sending out influences is, as we have seen, not necessary for astrology to be valid. Yet, as two passages reveal, he wishes such expressions in his work to be understood as more than just conventional turns of phrase. The first passage, an introduction to the constellations that lie above the northern Temperate Zone (1.310-313), makes those stars responsible for the climate in the region below them:

mixta ex diversis consurgunt viribus astra,
hinc vicina gelu, caelique hinc proxima flammis;
quae quia dissimilis, qua pugnat, temperat aer,

28 The notion is possibly borrowed from the technical vocabulary of relations between signs. On such vocabulary see below in this section and Chapter 4.

1.5. *The nature and mechanics of stellar influences*

frugiferum sub se reddunt mortalibus orbem.

'[In this part of the sky] there rise constellations which have part in opposite qualities, here closer to heaven's cold and here to its flames. Since these constellations are tempered by an atmosphere which is unlike its neighbours in so far as it is at variance with them, they render fertile for mortals the lands situate beneath them' (tr. Goold).

According to Manilius, of the stars that lie above this part of the earth, those closer to the south are in some way 'hotter' and those further north 'colder'. In combination, however, their conflicting impacts on the atmosphere yield a moderate and fertile climate. This theory has some basis in ancient traditions of natural philosophy: the proximity of equatorial regions to the path of the Sun was broadly (and correctly) recognised as a principal reason for their aridity, though no earlier author makes a clear causal link between actual constellations and the climate of the lands below them.²⁹ Manilius' theory of climate is, more importantly, a straightforward deduction from the basic tenets of his astrology: changes in air-temperature and the growth of crops, like all events, have their causal origins in the movements of stars. The stars responsible, however, cannot merely be those of the zodiacal constellations, which for him are tied more specifically to individual lands and peoples, and are made responsible for the racial and cultural differences the lands exhibit (4.807-817), even – crucially – those sharing a latitude. General latitudinal trends in climate must, then, be assigned to other stars; and in an interconnected, deterministic universe such as Manilius', it makes some sense to give this role to those stars physically closest to the parts of the earth's atmosphere under discussion. He offers us no indication here of the precise mechanics of the stars' influence on climate, just an

²⁹ Arist. *Met.* 1.3 looks at first sight to be a possible forerunner, but makes the sun the true source of heat.

unambiguous assertion that the stars cause, and not just indicate, the weather as well as an example of the influences that extrazodiacal constellations have within his system.

More insight into the mechanics of stellar influence is offered by the second passage, which explains why the power of the triangular relationship between zodiacal signs is so much greater than that of the square (2.354-357):³⁰

altior est horum summoto linea templo,
illa magis vicina meat caeloque recedit
et propius terras accedit visus eorum
aeraque infectum nostras demittit ad auras.

‘The side of the quadrate signs is higher, and their perimeter farther removed from us, whilst the side of trigons travels closer and draws away from heaven: their vision draws nearer to Earth and sends down to our atmosphere an air tempered by their influences.’ (tr. Goold)

Indulging in a touch of three-dimensional geometry, Manilius points out that the sides of an equilateral triangle inscribed in a sphere upon the plane of its diameter will pass closer to the sphere’s centre (i.e. the Earth) than would the sides of a square similarly inscribed. Since the *visus* (vision)³¹ that forms the sides of a triangle comes closer to the Earth than that which forms the sides of a square, the triangle’s *visus* comes to have a greater impact on the earth (for the reverse, cf. 2.377f.). This alone is very telling: for the impact of the *visus* to be affected by distance, Manilius must be envisaging it as a sort of physical force, as its name in fact suggests.³² It is not just a convenient metaphor to help astrologers conceptualise and systematise the ways in which groups of signs relate to events on earth.

30 That is, relationships between signs four and three signs apart, respectively.

31 On this terminology, see below in this section.

32 On the ancient conceptions of vision as a force exerted by the observer on the object seen, see Lehoux 2012, 111-115.

1.5. The nature and mechanics of stellar influences

Still, as line 357 reveals, their impact is not quite direct: the *visus* ‘sends down to our atmosphere (*nostras...auras*) an air (*aera*) ‘imbued’ or ‘tainted’ (*infectum*) in some way or other; one, presumably, that will bring about the expected changes in the world below.

It may at first seem strange that Manilius uses two words (*aer*, *aurae*) that in his elemental theory denote a single kind of matter (1.157f.).³³ This, I suggest, is a clue that the process of elemental transformation, which had hitherto appeared superfluous within Manilius’ cosmology,³⁴ in fact plays an important part in his understanding of stellar influence. It is clear that the proximity of the *visus* to the earth (and therefore the atmosphere) determines the quality of the air (*aer*) that the heavens send downwards into the atmosphere. Manilius makes clear that the stability of the universe depends on the balance and mutual exchange of the elements, and so will not allow for an ever-increasing quantity of any one element in his universe.³⁵ Where, then, is this *aer* coming from? He has given us a satisfactory answer already: that very process of elemental exchange.³⁶ If this interpretation is correct, the process offers a rather effective physical model for astrology: the heavenly bodies exert upon each other forces (denoted in the passage above by the word *visus* and elsewhere called *effectus* and *vires*); these interactions between the heavenly bodies determine the manner and configurations in which the fire, in its downward transformation, becomes air, and then (presumably) how that air becomes tangible matter, bringing about observable changes in the arrangement of matter on earth.

33 See comm. ad loc.

34 See Section 1.2 above.

35 See, for instance, 1.518-525 and 1.458-468.

36 His use of the words *aera* and *auras* is striking, too: paradoxically, the word generally used of the element in motion (*aura*) is here reserved for the air that is being acted upon, rather than of the air that is being sent down, denoted by the more neutral *aer*, as if to stress that it is not just a case of heaven setting pre-existing matter in motion.

Matter, in its ever-changing form, serves as the vehicle by which the forces exerted by the heavenly bodies reach and then impact upon the earth.

The theory of stellar influence by elemental exchange has various advantages over the earlier, simpler understanding of the heavens as exerting some undefined *vis* upon the earth below. First, it sits well with the theory of climate discussed earlier (1.310-313), offering a single explanation for how the stars come to influence both air temperature and earthly events. Second, it explains how forces exerted horizontally between signs can also be understood as having a corresponding downward effect, an issue not addressed by earlier astrology, at least as understood by Cicero.³⁷ The greatest advantage of all, however, is that it allows Manilius to evade a particular criticism of the forces-model of astrology – namely, that it ascribes so much power to objects very far away but none to the weather, which is not only closer but often far more dramatic.³⁸ In the interconnected, solid universe of Manilius, in which all stellar influence is transmitted by elemental exchange, intervening matter does not impede the influence but facilitates it.

We have explained the nature of influences coming downward from heaven; but what of those exerted horizontally between heavenly bodies? The signs and planets are said to engage in a whole host of interactions more familiar from the domain of human experience: they do not just ‘see’, but hear, love, betray and engage in conflict with each other.³⁹ Given the lively colour with which Manilius depicts these interactions, one might assume that he means them literally. However, this cannot be the case, since his chosen

37 Cic. *Div.* 2.89 (quoted in Section 1.1 above): there the zodiac *as a whole* is thought of as exerting a downward force, with its nature shaped by the positions of planets and the interrelations of its parts.

38 Cic. *Div.* 2.91f.: see also Chapter 2 *passim*.

39 2.466-641.

1.5. The nature and mechanics of stellar influences

world-view sees the heavens as the embodiment of harmony and reason. All the same, the received technical language of astrology so often has the stars and planets engaged in some sort of hostility that, for his teachings to be at all representative of the science, he is compelled to employ the same kinds of expression, as inconsistent as they may seem with his cosmology. Nonetheless, as mere metonymies, they can still serve as a convenient shorthand, and when used of the signs, offer the student an easy way to remember the nature of their effects on mortals.

1.6. Theology

Much of Manilius' understanding of divinity has already come to light in the preceding sections – so central is it to his cosmology and physical model. We have seen that his one divine force is assigned various names, each of which can be rendered by one of the following: 'God', 'force', 'spirit', 'mind', 'reason', 'fate' and 'fortune', 'heaven' and even 'universe'. The range of terms allows Manilius, by selecting one over the rest, to draw attention to a particular quality of the divine, and offers his student various avenues towards understanding God.

The *Astronomica* assumes no prior familiarity with its theological perspective – even a modern reader with no knowledge of parallel beliefs in Stoicism will not come away from the poem with much doubt as to the character of the divine or its relation to man.⁴⁰ Yet the manner in which this information is revealed to the reader is striking. Very rarely does the poet tell us explicitly that two of his terms have the same ultimate referent.

40 The one area where room remains for doubt – ethics – is discussed further in Sections 1.8 and 1.9.

The Universe of Manilius

In most cases, we are left to deduce these facts for ourselves. The poet makes this easy enough, often assigning the same role within the universe to different divine identities on different occasions. On other points, we are left to chew over apparent inconsistencies – such as the identity of God with universe and that of God with just the heavens – and to realise that the problem is one of language and not doctrine.

The posing of such puzzles for the reader is a Lucretian device: when that poet speaks of Nature personified, for instance, he feels no obligation to explain that this is just a manner of speaking. Instead, he leaves it to the reader to deduce that fact from its inconsistency with his core message. In the *Astronomica*, such ‘puzzles’ are also distributed strategically, most notably in the prologues to Books 2-4, which introduce us to God, Nature and Fate respectively.

The question of the divine and its relationship with mankind has received excellent and in-depth treatment from Volk.⁴¹ I shall, however, offer a sketch here for completeness’ sake, and offer an alternative perspective on some of the less generous points in Volk’s reading.

Manilius’ universe is guided by the divine force, which in this governing capacity is often referred to as Reason (*ratio*). After a certain stage in the development of human society (1.66-72), Reason came to reside also in mortals, spurring some of them to investigate the heavens (1.40-50) where the divine force is most concentrated (1.37). Man became at that point a universe in miniature (microcosm), being an interconnected organism guided by Reason, and came to recognise his kinship to the whole through this

41 See Volk 2009, 216-226, 251-258, 261-264 and Volk 2001.

1.6.Theology

similarity (4.888-895). The power of Reason permits some (though by no means all)⁴² to pursue their investigation of the heavens to a point where they can discover the future based on their observation. Fate – the exercising of divine Reason as a whole – has determined which among mortals will attain such a privileged status. Manilius himself is part of that plan, fated to compose his work, thereby also part of a causal chain leading to the mastering of astrology by others fated to do so.

Note that this is one of many ways of conceptualising the God-man relationship according to Manilius,⁴³ some of which at first seem deceptively incongruous. Consider, for instance, the following two answers to the question, ‘How is it that man acquired his knowledge of astrology?’

(A1) He has done so by mastering the heavens and seizing it for himself (1.96-98).

(A2) It is a divine gift, given through the heavens’ self-revelation; for no one could attain such knowledge unless the heavens themselves willed it (1.25-27, 2.115-25).

These two answers do, at first blush, seem mutually incompatible. For Manilius, however, the two answers are equally valid and wholly consistent conceptualisations of the working of *Reason*: it is one and the same force that permits and achieves the acquisition of astrological knowledge.⁴⁴ Both answers are correct, though one will at times be more pertinent than the other, depending on whether the topic of discussion is man or God.

42 It is for this reason, presumably, that Manilius calls God/Nature the ‘guardian of things hidden’ (*custos latentum*, 3.47).

43 Alert readers will have noticed, for instance, that I made no mention of Mercury’s involvement in man’s discovery of astrology. The reason for this omission is given in Section 1.7 below.

44 In a deterministic universe, this naturally raises difficult questions concerning the agency and responsibility of individuals. On this topic, see Section 1.8 below.

The Universe of Manilius

Apparent contradictions in Manilius are not always, therefore, as problematic as they first seem. That they *seem* problematic is, however, of enormous importance. For in striking us as inconsistent and giving us thus pause for thought, apparent contradictions of this kind serve as yet another variety of puzzle of the Lucretian type, as described above. That statements along the lines of (A1) are so often charged with language suggesting impiety (Volk 2001) should be seen as essential to the device's effect: the greater the jolt, the less likely the student is to shrug his shoulders and move on without giving the matter due consideration.

Let us look now at Manilius' understanding of the nature of the mind or soul, shared both by man and universe. Manilius offers little information about the fate of the universe's soul at its death; on what awaits man's he casts more light. Manilius believes, first of all, that upon death our souls (or minds) will return to heaven, whence they came (4.886-892):

an dubium est habitare deum sub pectore nostro
in caelumque redire animas caeloque venire,
utque sit ex omni constructus corpore mundus
hospitium menti totum quae infusa gubernet,
sic esse in nobis terrenae corpora sortis
sanguineasque animas animo, qui cuncta gubernat
dispensatque hominem?

'Can one doubt that a divinity dwells within our breasts and that our souls return to the heaven whence they came? Can one doubt that, just as the world, composed of the elements of air and fire on high and earth and water, houses an intelligence which, spread throughout it, directs the whole, so too with us the bodies of our earthly condition and our life-blood house a mind which directs every part and animates the man?' (tr. Goold)

1.6.Theology

For Manilius, man's animation comes from the presence in him of God (*deus*), in the form of his mind or intelligence (*mens*), just as the macrocosm has in it a *mens* that permeates and directs it. This part of God has come down from heaven and, after the man's death, will return there (886f.). This accounts for the striking metaphor of the body (and indeed the physical world at large, too) as just a *hospitium* or 'guest-house' for that intelligence, since it is only a temporary abode. This does not necessarily add up to a belief in the immortality of the *individual* soul – an issue on which Manilius leaves us in the dark, along with all others concerning the nature of eternity.

For some men, an afterlife of a more definite and illustrious nature awaits, with a residence awaiting them in the Milky Way (1.758-804).⁴⁵ The passage owes its inspiration to Cic. *Somn. Scip.* 16, where that celestial circle is said to be the general destination of human souls after death.⁴⁶ For Manilius, however, the circle's population is limited to the souls of the great and worthy (758), allowing him to boast that that the resident Roman souls now outnumber those of other nations, including the Greeks (777). Before listing the Romans, however, Manilius presents us with two other groups, the former comprising valiant heroes of the Trojan War (762-770), and the latter made up of Greeks who applied their wisdom to issues concerning the good of the state (771-776). Each group represents one of the two virtues – heroism and patriotism – that are exemplified by Manilius's

45 The passage's length and final position in a list of competing explanations of the Milky Way suggests the poet's endorsement of it, and the straightforward assertion of the view at 803f. confirms this. The poem's final simile, however, voices support for the fourth explanation, too, that the Milky Way is a dense mass of stars (5.742-745; 1.755-758). We should conclude, then, that for M. the souls of the virtuous become the stars that make up the Milky Way.

46 Cicero is generally thought to have taken inspiration from a certain Pythagorean view of the Milky Way as the temporary resting-place of dead souls awaiting reincarnation (see Volk 2009, 244f. with Heracl. Pont. fr. 96f.). This, however, was not the standard Pythagorean view transmitted by the doxographical tradition (for which see *PP* 3.1).

The Universe of Manilius

Romans (another connection he leaves us to make for ourselves).

As the poem's final simile reveals (5.742-745), it is in the form of stars that these souls make up the Milky Way. This offers some reassurance to any readers concerned that the supposedly changeless face of heaven is not, in fact, changeless at all: being already a mass of indistinguishable and innumerable stars, and one with no predictive astrological role to boot, the Milky Way makes for a rather suitable final resting-place. That same simile tells us that Nature has not given these stars 'powers to match their number' (5.735), a further relief, since the aether could not bear such flames and the whole universe would burn (5.744f.). What happens to the souls of lesser men is left uncertain: it may be that the fire of which they are presumably made up, on returning to the aether, takes on no fixed form there.

A unique fate, however, awaits Augustus, to whom Manilius promises immortality not in the Milky Way but in the Zodiac itself (1.799-802), the part of heaven reserved for the gods (1.803). This honour is, above all, a reflection of the greatness of Rome's first *princeps* as a ruler: for unlike those of the Milky Way, the celestial bodies of the Zodiac are responsible for the governing of earthly events. Augustus' deification may well entail a rather greater change to heaven than the death of any other great man: for what nature will the soul of the *princeps* assume on entering the Zodiac? The issue is left wisely unaddressed: to commit to any particular prediction (if Augustus was still alive at this point) would set Manilius up for potential embarrassment upon Augustus' death. By not committing himself, however, he leaves his readers with the danger of a headache: will the face of the heavens undergo change after all? Not necessarily: the fire of which his soul

1.6. Theology

consists could, perhaps, be added to that already making up the planets and signs of the Zodiac, so that he can continue to govern the earth from the sky (4.552) and heaven can 'grow greater still' (4.935) without looking any different. That he does not allow us to say for certain, however, may well be more a product of tact than of conviction.⁴⁷

1.7. Traditional religion and myth

If what is outlined above is the true nature of divinity for Manilius, how then should we account for his many mentions of the deities of traditional Greek and Roman religion? What, too, should be made of the frequent retellings and mentions of myths that so often involve the gods? Even where they do not, they can be just as problematic: readers may at first struggle to reconcile Manilius' tales of catasterisms in Book 1 with his belief that the array of heavenly bodies are changeless and existed even before the earth did.⁴⁸ He appears to switch readily and often between two understandings of the divine, the one outlined above and the more familiar classical pantheon. Is this a case of Manilius 'having his cake and eating it too'? And how much truth would he have us see in the mythological explanations he provides for so many of the constellations?

Once again, Lucretius serves as an informative parallel case. When he speaks of deities interacting with the physical world, we know to take them merely as metonymies of natural phenomena or animal behaviour.⁴⁹ This is not just because he reminds us

47 It is perhaps striking that Julius Caesar is included in the Milky Way, given that he was supposedly immortalised in the comet of 44 BC (the 'sidus Iulium'). Manilius, I suspect, is skirting over the issue to avoid having to explain why the divine Caesar was visible in the heavens for only a few days.

48 Volk 2009, 264 sees an irreconcilable inconsistency here.

49 On Lucretius' use of traditional divinities and myths, see Gale 1994, 229f. and Schrijvers 1970, 50-66.

The Universe of Manilius

repeatedly that the true gods dwell in a world apart from ours, with no concern for it. For, as noted above, he also reflects upon such figurative expressions (Lucretius 2.655-660) and suggests that they are tolerable so long as the speaker takes care not to let his mind be tainted by superstition (*dum vera re tamen ipse | religione animum turpi contingere parcat*, 559f.). Newcomers to the *DRN* can be excused for thinking that, in its prologue, Lucretius really is speaking about the deities Venus and Mars. They are then left to deduce from the following attack on superstition that this is not in fact the case. Despite such contradictions, Lucretius leaves us with no suspicion that he holds any conflicting attitudes towards religion. Nor, in a poem that places so much importance on the subject, are we tempted to attribute the inconsistencies to carelessness or indifference. Rather, as puzzles, they serve to make us pause and reflect on the issue, and test our receptivity of his teachings on superstition and I suspect that the *Astronomica* aims to provoke the same kind of reflective response in its references to traditional religion and myth. It, too, gives great weight to its teachings on the divine. In the prologue to Book 2, Manilius announces the great and novel theme of his poem not as astrology but God, the divine force that unites and rules the universe (2.60-62);

namque canam tacita naturae mente potentem
infusumque deum caelo terrisque fretoque
ingentem aequali moderantem foedere molem

'For I shall sing of God, silent-minded monarch of nature, who, permeating sky and land and sea, controls with uniform compact the mighty structure' (tr. Goold)

Like Lucretius, Manilius provides ample information on the true nature of the divine,

1.7. Traditional religion and myth

repeating the central points throughout the poem. And as with the *DRN*'s reflection upon figurative use of the gods' names, the *Astronomica* also offers a clue for how to interpret its own apparent contradictions. At 2.434-448, Manilius lists the tutelary deities that Nature has associated with each of the twelve signs of the zodiac,

cum divina dedit magnis virtutibus ora,
condidit et varias sacro sub nomine vires,
pondus uti rebus persona imponere posset.

'when she gave divine faces to the great virtues and established various powers under holy names, so that a *persona* ('personhood') might lend weight to the qualities'. (tr. adapted from Goold)

Manilius would have us understand here that the traditional Greco-Roman gods are simply means, devised by Nature (i.e. God singular), of giving a human face to various *virtutes* ('virtues' or 'powers'). The word *persona* (meaning 'dramatic mask', 'character', 'role', or the actual person playing the part) leaves it tactfully ambiguous what precise ontological status he assigns them, whether they are mere symbols or real divine agents as understood in the traditional religion.⁵⁰ Either way, the passage makes it clear that they do not act independently of the will of the single, world-unifying divine force. Nature, according to Manilius, invented the gods as a means for man to conceptualise aspects of herself. Man's belief in them is, therefore, not necessarily misguided, conforming as it does with Nature's plan; but it alone does not offer a complete understanding of the divine.

The context of the passage is also revealing. If he saw no problem in employing two contradictory models of the divine in his teachings, he would not have included these

⁵⁰ Cf. Cic. *ND* 1.40.

three lines, which are in no way essential to the astrological doctrine presented here and can be omitted without harming the lesson. Their content, however, is plainly of great importance to Manilius, who feels he must account for the presence of traditional religion in his astrological teaching. The passage on the tutelary deities is the first instance of this, and he is keen to avoid any potential confusion on the student's part. This is not the behaviour of a careless or indifferent teacher.

Of the traditional deities who appear in the *Astronomica*, the most puzzling is surely Mercury, whom the poet invokes in his prologue as the founder of astrology (1.30f., 34)

tu princeps auctorque sacri, Cyllenie, tanti;
per te iam caelum interius, iam sidera nota
nominaque et cursus signorum, pondera, vires

'You, God of Cyllene [Mercury], are the first founder of this great and holy science; through you has man gained a deeper knowledge of the sky – the constellations, the names and courses of the signs, their importance and influences' (tr. Goold).

Most modern readers of Manilius have identified Mercury here with the Egyptian Thoth, seeing the invocation as evidence for a Hermetic element in the *Astronomica*.⁵¹ The conclusion is only tentative, as we have no Hermetic work that predates the *Astronomica*. However, Diodorus Siculus (1.10ff.) offers confirmation that, from at least as early as the first century BC, Hermes had come to be recognised as the inventor of language, writing,

51 Volk 2009, 239 is surely right to assume that Hermetic philosophy, if it was available to Manilius, would have appealed greatly to him. On the supposed presence of Hermetism in Manilius see Valvo 1956, Valvo 1978 and Vallauri 1964.

1.7. Traditional religion and myth

music and astronomy, presumably through syncretism with Thoth, whom Egyptian religion credits with the same set of inventions.⁵²

While Manilius may certainly be nodding here towards this new identification of Mercury and Thoth, he himself is no believer in the special status of that god. As with his other references to conventional divinities, Manilius reveals his true standpoint on the invention of astronomy soon after, crediting mankind itself with it (1.109). Yet again, the god is no more than a symbol.

The role and truth-value of myth in Manilius' world-view remains a puzzle. He makes no excuse for his frequent appeals to myth to provide *aitia* for the shapes, and later the powers, of the constellations. In the zodiacal geography (4.711-817), for instance, the Ram's catasterism-myth is invoked to explain its particular dominion over the Hellespont (4.746-748):

asserit in vires pontum quem vicerat ipse,
virgine delapsa cum fratrem ad litora vexit
et minui deflevit onus dorsumque levare.

'[The Ram] claims for his influence the sea which he overcame himself, when after the girl had slipped off he bore her brother to the shore and wept over the reduction of his burden and the relief to his back.' (tr. Goold)

Would Manilius have us take the Ram's deed and consequent catasterism as historical events? Although the poem does not address the matter directly, an answer may be found

52 See Gera 2003, 115-118. Plato, *Cratylus* 407e-408b attributes the invention of speech to Hermes, but none of the other arts. For parallel attributions of such arts to Hermes, see Horace *Odes* 1.10.1-3, *Ov. Fast.* 5.663-8.

in the description of earlier astronomical poetry at 2.37f.:

quorum carminibus nihil est nisi fabula caelum
terraque composuit mundum quae pendet ab illo.

‘In their songs heaven is nothing but a fairytale, and earth has made up the sky on which it actually depends.’

These lines have prompted accusations of hypocrisy from Manilian scholars, who have typically read them as critical of the attention given to catasterism-myths by Aratus and his translators, something of which Manilius is no less guilty. This interpretation, however, places too little focus on the second of the lines: according to these poets, it is earth that has made heaven what it is; not the other way around, as Manilius himself would have it. The *Phaenomena*-poets commit this misdemeanour in two different ways. The first, observed by Volk, is their assigning an earthly origin to constellations in their catasterism-myths, with the result that ‘the constellations are literally constituted of creatures from earth’ (Volk 2009: 112). Secondly, Aratus credits some unknown man of old with grouping the stars into constellations of clearly defined shape, and with giving each group a name (Arat. 370-384). For Aratus this raises no problems, since in his world there is rarely any connection between what each constellation resembles and the effect it indicates as a sign set up by Zeus. For Manilius, however, the grouping and naming of constellations can be no work of man. The influences each constellation has on the world below invariably depend on the character of the thing the constellation resembles, or some detail in its catasterism-myth. This correspondence is particularly observable in the *paranatellonta* of Book 5, but runs throughout the poem, providing a clear rationale for

1.7. Traditional religion and myth

many points of astrological teaching. The identity and character of the constellations, then, were written into the universe's design from its inception.⁵³ What, then, about their back-stories? Since, as already mentioned, the heavens of Manilius' universe took shape before the earth did and are changeless, too, there is no way in which the catasterism-myths can be true for him. But since their detail so often informs the influences a constellation has upon the earth, it cannot be that he included them simply to meet the generic expectations of an astronomical didactic poem. The best answer may be to see myths as having a similar status to the traditional gods, namely as an invention of Nature to assist man in his understanding of the universe. The stories, in other words, offer rationales for the constellations' shapes and influences, and allow Manilius to provide his student with mnemonics to assist his remembering of the latter. Manilius can thus be absolved of all counts of making earth the composer of heaven, for all his storytelling.

1.8. Fate and its ethical implications

Manilius, we have seen, understands the universe as a fully deterministic structure which, like a machine, operates in an entirely predictable manner. Everything, all the way down to human decision-making, is subject to an unchangeable fate. What is more, man has acquired the ability to discover the future through observation of the heavens and, so long as he correctly applies known methods, will do so unerringly (2.130-136). It is vital that we acknowledge the uniqueness of this belief among ancient astrologers: no doubt

⁵³ This explains, presumably, why Manilius feels he must account for the crude appearance of the constellations (1.461f.): *non poterit mundus sufferre incendia tanta, | omnia si plenis ardebunt sidera membris.*

working practitioners of astrology used such claims to lure in customers, or boasted of a perfect success-rate, but this is not the typical picture that emerges from surviving handbooks on the subject, or even sceptical testimonies. In Cicero's *De divinatione*, pre-Manilian astrology comes across as a science that claims only to predict certain specific things – the character, profession and general destiny of human beings.⁵⁴ It is recognised, too, that along with all skill-based divination it could sometimes err through the need for human interpretation or conjecture. After Manilius, too, astrologers are loath to commit themselves to full determinism (as is Ptolemy) or produce horoscopes with so many conflicting but valid interpretations to choose from that the potential for human error is enormous (see Beck 2007: 91-93 and my Chapter 3). That Manilius' bold claims are not more widely attested is easy to understand: for what working astrologer would be brave enough to subscribe to them? As I argue in Chapter 2, he has adopted them as a safeguard against certain criticisms from Academic sceptics, and perhaps without fully considering and accommodating for all of their implications.

The ethical perspective of the *Astronomica* offers the most glaring case of neglected loose ends. The prologue to Book 4, a long meditation on human nature and the ineluctability of fate, exhorts us to free our minds of our habitual cares and desires (1-13), acknowledging that there is nothing we can do to change our fates (14-16). So far so good, perhaps. Manilius then sets forth the following sequence of thoughts.

(1) Fortune makes no distinction in her treatment of men, taking no account of vice or

54 That is, as opposed to absolutely anything, inanimate objects included. The way in which Cicero writes of Lucius Tarutius' horoscope for the city of Rome shows that such predictions were unusual (*Div.* 2.98f.). Moreover, if the astrologers of Cicero's day claimed the power to predict more than just the 'general destiny' of an individual, he would no doubt have said so: for seeing as his purpose in the work is to refute and to an extent ridicule astrology along with all divination, such a claim would have made that task a good deal easier.

1.8. Fate and its ethical implications

virtue (4.94-97).

(2) A moral offence (such as adultery) does not receive divine punishment (such as monstrous offspring) (104).

(3) However, this does not excuse crime or deprive virtue (*virtus*) of its rewards (*praemia*).

We do not hate poisonous plants any the less because they are by nature poisonous, or favour good food any the less because it did not choose itself to be so (108-113).

(4) Men's virtues (*merita*) in fact deserve all the more glory, because they owe their praiseworthiness (*laus*) to heaven. Criminals, on the other hand, deserve all the more hatred since they are born destined for guilt and punishment (*in culpam poenasque creatos*) (113-116).

(5) It is in accordance with fate too that Manilius is thus dwelling upon the nature of fate itself (118).

Fated or not, this attempt to reconcile full determinism in accordance with divine will with individual moral responsibility does not exhibit the level of care invested elsewhere in the shaping of the poem's world-view.⁵⁵ The Stoics received much ridicule in antiquity for what appeared to their critics to be this very cluster of beliefs. They, however, gave much thought to the concomitant problems, developing a more nuanced understanding of Reason that left room for individual freedom of will as well as thought.⁵⁶ Manilius, on the other hand, advocates precisely the view that the Stoics' critics misunderstood them to

55 On this passage, see the excellent discussion of Volk (2009, 253 n. 64). I do not share her surprise, however, at finding such a perspective in a work that attempts to evangelise and encourage new recruits to persevere in their studies: a similar belief and behaviour have not thwarted the success of the Calvinists or Jehovah's Witnesses.

56 Frede 2003, 201-205.

have, leaving us only one freedom, the choice which attitude we have toward our fate (4.12f.).⁵⁷ This leads him to formulate his advice in paradoxical ways, such as the following (4.481f.):

si te fata sinant, quartam ne selige partem
Centauri; fuge et octavam

‘If the fates *were to* allow you, choose the fourth degree of the Centaur and avoid the eighth.’

Unlike the Stoics, he places no importance on debating matters of justice, or basing moral decisions on careful reasoning; for, unlike them, he sees the will and decision-making of individuals merely as a product of, rather than a contributor to, the universal Reason. Despite drawing a close connection between God and man (see Section 1.6 above), and making his God immanent in the world, Manilius seems happily to conceive of divine will as something *outside* the world (almost as if it were a god in the traditional understanding of the word) rather than as something of which each individual’s will forms a part. It is this that allows him to believe in rewards (*praemia*, under (3) above) for human virtue, meaning, presumably, immortality in the Milky Way (1.758-804), a privilege reserved for men of great virtue, not just great deed (see Section 1.6 above).

Manilius often uses the ethically loaded term *lex* (‘law’) to denote the incontrovertible physical principles that bring about fate.⁵⁸ These ‘laws’ exist not just for Nature herself to ‘obey’ (whatever that precisely means), but man too. This appeal to the

57 Manilius makes it clear elsewhere that man has at least some control over his mental endeavours: perhaps only a few are destined to attain understanding of astrology, but we are all able to turn our minds to such areas of enquiry (4.395).

58 A fascinating remark at 4.88 offers to explain why not every age has brought forth a Cato, Camillus or Decii: there is more than enough matter to make such a thing possible, but that ‘matter resists through (divine) law’ (*materies in rem superat sed lege repugnat*).

1.8. Fate and its ethical implications

notion of laws produces a striking discontinuity with the belief in reward for virtue: merely abiding by Nature's laws is not enough to keep out of trouble and avoid punishment. In fact, it is very often the 'obeying' of these laws (that is, the fulfilling of an individual's destiny) that lands one in trouble, where infringing them – were such a thing possible – might even have led Nature to reward the individual. Manilius is, of course, free to exploit the potential of laws as an analogy for the rules of fate without committing himself to outright contradiction – just as Lucretius can employ the idea of *foedera* ('alliances') between atoms without assigning them intelligence or agency. It strikes me, however, as a rather inopportune choice, shedding more light on the flaws in his ethical framework than on the workings of fate.

The shortcomings of the poem's ethical outlook find their fullest voice, however, in the discussion of comets and their significance (1.813-926). In a passage that has long baffled his readers, Manilius presents the following train of thought:

- (1) It is possible that God issues comets out of pity, as harbingers of disaster (874f.).⁵⁹
- (2) The heavens never blaze with fire in vain (876),
- (3) and comets generally mark some sort of disaster (877-904).
- (4) Often the fault (*culpa*) lies with us: we do not know to trust in heaven (905).⁶⁰

It is not the case that the comets offer warning of a potential (but not necessary) disaster which, by heeding them, we could avoid. Rather, the comets appear *if and only if* a

59 It is important to note that the disjunctive conditional whose final protasis comprises (1) above only raises the possibility that God sends comets out of pity for mankind. Although Manilius does not commit himself to this belief, what is striking is that he deems it worthy of consideration.

60 *Saepe domi culpa est: nescimus credere caelo.*

momentous event such as a disaster is *necessarily* going to happen. True, they may give us chance to face our doom with the appropriate resignation, a possibility suggested by (1); and true, for Manilius the blame for any human disaster really does lie with the doer. But it is by no means true that, were we to ‘trust in heaven’ (i.e. take heed of the signs), we could go so far as to *avoid* the fated deed and consequent *culpa*.

It may surprise some readers to discover that ethical matters were typically a major preoccupation of ancient astrologers.⁶¹ Manilius’ shortcomings are, therefore, particularly remarkable and deserve consideration. There is, I believe, a good explanation, which will be set forth in the following section.

1.9. The source(s) of the Manilian universal model

In most cases, the individual aspects of Manilius’ world-view also appear in a wealth of earlier philosophical sources, with a great majority belonging also to Stoic doctrine. On other points, such as his understanding of the afterlife (Section 1.6 above), Manilius has clearly incorporated beliefs foreign to the Stoics, adding his own innovations all the while to guarantee as much consistency as possible for his world-view. This degree of eclecticism, as well as his adherence to astrology specifically, suggest that Manilius was first a convert to astrology and only later developed Stoicising philosophy, presumably seeing the potential in the school’s natural-philosophical beliefs which, suitably tailored, would be immune to the criticisms of earlier sceptics.

Noting the parallels between Manilius’ world-view and the version of Stoics beliefs

⁶¹ See Barton 1994a, 2.

1.9. The source(s) of the Manilian universal model

set out in Cicero's *De natura deorum* 2, Volk has tentatively suggested that text as a source for the *Astronomica* (Volk 2009: 233f.). It is certainly clear that Manilius was familiar with other works of Cicero, such as his translation of Aratus, the *Somnium Scipionis* and, as my next chapter demonstrates, the *De divinatione*. Volk's suggestion is therefore perfectly reasonable.

In fact, I am tempted to go one further and make a much stronger claim – that Manilius has constructed his entire view of the universe from components found in a limited selection of Cicero's philosophical works. Excluding points that are manifestly the poet's own innovations, every one of the beliefs detailed in the sections above is found in Cicero's *Somnium Scipionis*, *De natura deorum*, *De divinatione* or *Academica* – that is, the works that hold the greatest potential interest for an astrologer.⁶² Secondly, and more importantly, there is a striking correlation between the grey areas in Manilius' world-view and the aspects of Stoic doctrine that are either not thoroughly discussed or outright misunderstood in those works – the relationship, most notably, between full determinism and moral responsibility, the cosmic cycle and (of less significance) the length of the Great Year.

This cannot account, of course, for every claim the *Astronomica* makes about the universe: the hard astrological detail had its own source material, and it is clear that Manilius has made use of an astronomical manual in the tradition of Achilles' *Eisagoge*.⁶³ Meanwhile, the vexed question of the poem's relationship with the Hermetic tradition

62 That Manilius does not seem to have drawn on the *De fato* may be due simply to the incomplete transmission of that work.

63 The *Eisagoge* is an astronomical manual dated tentatively by Maas to the third century AD (Maas 1958, 25-75). The work draws heavily on *Placita*-literature (collections of philosophers' opinions), and the familiarity Manilius shows with *Placita* may derive from his use of an ancestor of Achilles' handbook. See comm. on 1.122-148 on the tradition of *Placita*-texts and Manilius' engagement with it.

remains unsolved.⁶⁴ Nor can a claim of this nature ever be proved, however strong the case: for Manilius could be working from a Latin astrological source that had already done the leg-work of finding and re-fitting Stoic beliefs to suit the discipline's needs. The next chapter, however, will tell against that possibility, showing that Manilius himself was working closely with the relevant material in Cicero specifically. Although he was not the first astrologer to borrow from the Stoics (see the passage of Diodorus in Section 1.1 above), Manilius appears to put in his own research into the school's beliefs before compiling his own theory of the universe.

64 Occam's razor would do away with it altogether, since every point of contact is also found in Cicero's accounts of Stoic beliefs. The invocation of Mercury can also be explained away (see Section 1.6 above) but remains a tantalising clue. It is perhaps safest to take Manilius as evidence for an early stage in the forming of the ideas that came to be called Hermetism, most significantly the syncretism of astrological and Stoic beliefs.

1.10. Conclusions

The picture that has emerged of Manilius' world-view is impressively consistent. This impression, of course, owes something to my method, which has involved deliberately seeking out explanations for any *prima facie* inconsistent claims rather than problematising them, as Volk has done. This method has, however, proved immensely informative: the supposed inconsistencies in fact very closely conform to a type found in Lucretius, where it has generally been agreed to make better sense as a didactic device than as a sign of tension in the poet's belief-system. This more charitable approach to the similar self-contradictions in Lucretius has yielded rich readings into his poem's didactic methods: I hope that by applying the same approach to the *Astronomica* this survey will offer a valuable and no less convincing alternative to the less charitable interpretations that have prevailed in Manilian scholarship through the lasting influence of Housman.

The survey has uncovered several points of didactic interest besides that of deliberate self-contradiction. In the case of the various conceptualisations of God, we have seen Manilius staggering the information in a way that makes the complexity of his Stoicising theology easier to get to grips with. We have seen that, far from assuming a background familiarity with Stoic cosmology, physics and theology, Manilius has taken care to accommodate the needs of even those readers with no relevant knowledge.⁶⁵ This is in striking contrast to the assumed level of familiarity with poetry (on which see Chapter 4) and suggests perhaps that the beliefs were not quite as 'mainstream' as some

65 This is not to deny that there are also subtle allusions to Stoic doctrine that only an informed reader would recognise: the presence of such references is no stranger than the common practice in modern children's programmes of including jokes that only adults could appreciate.

have imagined them to be.

Finally, we observed the sheer brazenness and self-delusion that would be needed for any working astrologer to embrace the *Astronomica's* world-view (Section 1.8). And yet, at the same time, the degree of care invested in its development has revealed the seriousness of the astrological conviction the poem professes. This incongruity raises fascinating possibilities about the beliefs and practices of its author and readers. It is tempting to imagine that for some, astrology held a greater significance as a belief-system than as a practical discipline, something that has turned out to be true of many renaissance and early modern proponents of alchemy.⁶⁶ We shall explore an alternative explanation in the next two chapters – that the *Astronomica's* approach to astrology reflects an unstable, but surprisingly long-lived, rally in resistance to the attacks of its critics.

66 See Nummedal 2011 on the wide-ranging focuses of treatises in the alchemical tradition.

Chapter 2: Manilius in defence of astrology

The first book of the *Astronomica* may at first come across as little more than an astronomical primer to the four books of astrological teaching that follow, but it has another, more important function: to persuade the student that astrology is both possible and worth pursuing further. The book contains some of the strongest arguments in favour of astrology to survive from antiquity and engages carefully with the earlier criticisms of the discipline presented in Cicero's *De divinatione* (2.89-99). The manner in which Manilius proofs his version of astrology against these attacks is the subject of this chapter. In conjunction with the next, it sets out to examine Manilius' rejoinders and reveal their lasting importance in the dialogue between the adherents and critics of astrology.

The first part of this chapter sets out the arguments presented in *De divinatione* and demonstrates how, in each case, Manilius has avoided their snares. Although the same arguments may well have been widely attested in Manilius' day, a clear response to a Ciceronian pun on *ratio* reveals that he is engaging specifically with *De divinatione*. The second part of the chapter looks in detail at the prologue to Manilius' first book and finds that it has been carefully tailored to proclaim the immunity of his astrology to this set of attacks.

In exchange for this immunity, Manilius has had to make some considerable sacrifices that open his own, fully deterministic form of astrology up to a new set of objections. The cost of Manilius' defence and the ensuing second wave of attacks will be the subject of the following chapter.

2.1. Cicero's critique of astrology

The first book of the *De divinatione* contains a long defence of divination of all kinds, put in the mouth of Cicero's brother Quintus, who approaches the issue from the position of a Stoic apologist. In the second, Cicero himself dismantles each of Quintus' arguments in his wonted Academic fashion, concluding at last that divination is neither possible nor desirable, and that the traditional Roman auspices are worth maintaining only as a means of preserving social order (2.28).

The astrologers, or 'Chaldaeans', gain Cicero's full attention at 2.87-99. After listing a handful of fellow critics, including Eudoxus and Panaetius the Stoic, he sets out the astrologers' fundamental beliefs, at least as he understands them (2.89).¹ There is some clear overlap with Manilian astrology (some appeal to universal sympathy, a concentration of some sort of *vis* or 'force' in the zodiac), but also some crucial differences: most importantly, there is no clear commitment to full determinism or the interconnectedness of the universe's parts.

The polemic that follows makes for easy enough reading, but is rather more difficult to analyse into its constituents. It is a brief and fast-paced run of arguments with no clear ordering principle. Cicero threads his arguments together using logical connectives such as *nam* and *enim* in a way that creates the guise of a single, structured argument but that really stretches the sense of those connectives to their limit.

The arguments are, by Cicero's own admission, mostly borrowed; and those that he

¹ A translation of this passage is printed on p. 17.

2.1. Cicero's critique of astrology

claims as his own are hardly more than rewordings of others he has already given. Determining the sources of his borrowed arguments is not entirely straightforward. He tells us at 2.97 that he has been presenting the arguments not of Carneades (on whom he had relied in earlier parts of Book 2) but of the Stoic Panaetius. Whether or not all the arguments against astrology presented hitherto were drawn from Panaetius, or just the most recent, is impossible to tell. Moreover, Cicero's evident delight in pitting Stoic against Stoic is likely to have shaped either the attribution or the selection of the arguments given. Pease's suggestion that Cicero was saving Carneades' arguments against astrology for the lost part of *De fato* has little to commend it: it is clear that a list of arguments against one specific type of divination would have no place in a work where divination is a side issue, and whose surviving part already contains Carneades' argument against the possibility of divination of any kind (*De fato* 31-33). It is more likely that among Carneades' arguments against divination, astrology was 'at most a minor topic' (Long 1982, 169). Certainly, *Div.* 2.89-99 gives the impression of being as comprehensive as Cicero could make it. If Carneades had offered any arguments against astrology distinct from those of Panaetius, I suspect they have been included, albeit unacknowledged, in this passage.

The best discussions of Cicero's polemic remain Pease 1923 and especially Long 1982. Mention is made wherever my interpretation deviates from the latter's, which does not always give full acknowledgement to the strength of Cicero's attacks.

After presenting the basic claims of astrology (2.89), Cicero shares with us the rather

weakened view of the Stoic Diogenes of Babylon, who holds that astrologers can predict nothing about a child beyond its character and professional calling (90). Cicero does not tell us why Diogenes ascribes any power to astrology at all, but instead open his volley of attacks with one of Diogenes' own arguments against conventional astrological prediction:

C1. *Twins may look alike but for the most part they go on to have different lives and fortunes (2.90).*

This frequently stated argument² assumes the premise that twins, being born in the same place at virtually the same time, have identical birth charts: if astrology is valid, therefore, any pair must have in common everything that astrology claims to predict from a birth chart.

Manilius protects himself from this attack by stressing how even the tiniest movements of the heavenly bodies produce great differences in birth charts (1.57, supported by, for instance, his involvement of the decans in his system: 4.294-407³). Even, therefore, in the brief moments that elapse between the births of the twins, the heavenly bodies continue their courses far enough to produce different destinies for each.⁴ Although Augustine attributes this argument to Nigidius Figulus, Cicero makes no mention of it in *De divinatione*. It is inconceivable that Cicero, a personal friend of Nigidius, could have been ignorant of this argument, which according to an anecdote in Augustine inspired the latter's *cognomen*. While the anecdote may be apocryphal, it is

2 See p. 99 below.

3 See p. 61.

4 For the inevitable rejoinder, that it is beyond our powers to perceive such tiny changes and so take them into account, see p. 86 below.

2.1. Cicero's critique of astrology

equally possible that Cicero knows but neglects to mention it (so Long 1982: 171), either because he is caught up in the task of recounting arguments from older sources, or to avoid needlessly weakening his own case. Either way, Cicero later presents a slightly fortified version of the same argument:

C1₂. *The fact that there are men born at exactly the same moment whose lives have nothing in common reveals that time of birth is not a factor in determining a man's fate. (95)*

Since there is no longer any interval at all between the births of the hypothetical natives, this argument trumps Nigidius' defence. The modification, however, opens the door for a similar reponse from later astrologers: for astrology, in its developed form, places great weight on the matter of which degree of the ecliptic is rising above the horizon as perceived from the place of the native's birth. The geographical point at which a child is born therefore has a great effect on its destiny. Since two babies born at exactly the same time cannot be born in precisely the same place, and are unlikely to be born very close to each other, astrologers can hold this responsible for the differences in their lives and characters.

Although Manilius does not make the point explicitly, he is certainly alive to the importance of the place of birth. Despite glaring errors in his presentation of method, he is keen to impart to his readers the importance of getting the place-sensitive calculation of the horoscope exactly right: if not, 'the foundations of our science are destroyed' (*fundamenta ruunt artis*, 3.207). Manilius goes on to devote nearly half of his third book

to the matter (3.203-509).

After the argument of Diogenes (C1, 90), Cicero offers no insights into his sources until 97, and presents each of the following in his own voice.

C2. Astrologers believe that the moon affects a person's destiny, and so take into account its position with relation to the stars at their birth. In doing so, they rely on the very untrustworthy sense of vision, rather than on reason (ratio) and intelligence (91).

C3. For they ought to consider the computation (ratio) of mathematicians, which shows that the Moon is comparatively close to the earth, while the rest of the heavenly bodies are extremely far away. What influence (contagio), then, can the planets have upon the Moon, or rather, on the earth? (91f.)

The argument from the inadequacy of sense evidence (C2) is made only in passing, as if merely to facilitate the wordplay of *ratio* ('reason [as opposed to perception]', 'mathematical computation'). In combination with C3, however, it is rather powerful in its own right: for the further away an object is from an observer, the less precisely the observer can estimate its distance from a second, nearer object. That the rest of the heavenly bodies are so much further from us than the Moon means that we can only ever judge very approximately where they are in relation to the Moon. Whether Cicero knew it or not, this point alone is enough to combat the claim of Nigidius Figulus above, and would later serve as a cornerstone of Sextus Empiricus' polemic against astrology (*Math.*

2.1. Cicero's critique of astrology

5.50-85).

Manilius' response to **C2** reveals that he is not only engaging with the set of arguments related by Cicero (which, for the most part, have their origins elsewhere) but with this very passage of *De divinatione*: for his counter-attack is directed specifically at Cicero's accusation that astrologers resort not to reason (*ratio*) but the imprecise sense of vision. For Manilius makes *ratio* a central piece of his diction (64 instances) and gives reason, with and without an initial capital, a fundamental role in his astrology. This alone is hardly surprising given the Stoicising nature of the *Astronomica*, and the technical use of *ratio* as the name of the guiding principle of both cosmos and man in Stoic theology. What is telling is the keenness with which Manilius emphasises reason as the astrologer's most vital tool, one that can compensate for the shortcomings of bare perception. Consider, for instance, how he introduces his discussion of the dimensions of heaven (1.539-560):

ipse autem quantum convexo mundo Olympo
obtineat spatium, quantis bis sena ferantur
finibus astra, docet ratio, cui nulla resistunt
claustra nec immensae moles caecive recessus;
omnia succumbunt, ipsum est penetrabile caelum.

'How great is the space occupied by the vault of the heavens and how great the territory within which the twelve signs of the zodiac move, we learn from reason, reason that no barriers or huge masses or dark recesses withstand; all things yield to reason, and it can penetrate the sky itself' (1.539-543; tr. Goold).

In his discussion of the decans – finer divisions of the zodiacal signs that are, confusingly,

Manilius in defence of astrology

named after the signs themselves (4.294-407) – Manilius anticipates his reader’s objection that these miniature signs-within-signs cannot be seen:

dissimulant, non ostendunt mortalibus astra.
altius est acies animi mittenda sagacis

‘[The decans] conceal their signs and do not display them to mortals. The knowing mind’s keen edge must cut more deeply’ (367f.: tr. adapted from Goold).

Manilius, therefore, is in full agreement with Cicero on the inadequacy of human vision, but manages all the same to fend off **C2** by placing *ratio* at the heart of his astrology and universe.

Argument **C3** poses no threat to Manilian astrology. We saw in Chapter 1.4 that it employs a mechanics of stellar influence in which distance is duly taken into account where it is thought to matter. More importantly, as his universe is an interconnected unit whose parts move in a regular, clockwork-like manner, there is no reason why the relative distances of the parts should have any bearing on their interactions. Even so, Manilius would have us believe that astrology is already immune to attacks on the plausibility of its physical principles: for whatever causal explanation one cares to give, his science (he says) is based on sound observational data that have shown not just that events on earth correspond identifiably with movements in the heavens, but that they are actually caused by them (1.51-65).

C4. *Astrologers believe that any two people born under the same arrangement of the sky*

2.1. Cicero's critique of astrology

and stars (status caeli et stellarum) will be identical and have identical things happen to them. Since the horizon moves along with one's location, at a single point in time the sky is different in different places, and so also must be the force it sends down. People born at the same time in different places are therefore born under different skies and so have different natures, a conclusion that is incompatible with the astrologers' belief that all people born at the same time, whatever the location, are born under the same conditions (92f.).

This confusingly worded argument permits several different readings, but one way or another takes astrologers to task for not duly considering geographical point of birth in their predictions. What makes the argument so problematic beyond that is the pair of similar sounding but in fact different claims attributed to astrologers at its beginning and end. In the first, astrologers are said to hold that two people with the same birth chart have the same nature and fate – a belief shared at least by later astrologers, including Manilius. It is hard, on the other hand, to imagine any astrologer holding the second belief, which is attested nowhere else: that people born at the same time, whatever their position, have the same birth chart. The second claim is presented in the manner of a recapitulation of the first, suggesting that Cicero believes (or would have us believe) the two claims to be equivalent. Since the argument's success depends on both claims being true, some error or sleight of hand is surely at play here.

One point can be made with confidence. Cicero certainly intends the argument to target astrology's mechanics: for at the crux of his argument lies the assumption that the same force can act on two different neonates only if the celestial configuration above them

is identical. It is also possible, though less certain, that Cicero means to imply a challenge to astrology's empirical basis – that is, to point out that the supposed set of Babylonian observations that permits the casting of nativities in Babylon cannot be assumed to work all over the inhabited world.

The argument, however interpreted, presents astrologers with a charge of which Manilius is entirely innocent: as discussed under **C1₂** above, geographical location is of immense importance in his system. Moreover, Manilius is safe from the mechanical charge implied in the argument. For differences of both longitude and latitude result in different arrangements on the fixed circle of a birth chart *precisely because* the sky the above varies accordingly.

As for the challenge to astrology's empirical basis, Manilius protects himself from this by identifying his science's development as a joint project of the Babylonians and the Egyptians (1.43f.), a matter to be discussed in full in the second part of this chapter.

C5. *If weather, being closer and often more dramatic than celestial phenomena, does not have any influence on the nativity, then nor can the subtle and imperceptible force that astrologers attribute to the configuration of the heavens (94).*

This argument appeals both to our notions of what is plausible and to basic physical principles: if we hold that weather, being very near and very noticeable, cannot influence a child's nature and destiny, is it reasonable to say that unseen and barely conceivable forces from the upper heavens can?

2.1. Cicero's critique of astrology

On both counts, argument **C5** fares no better against Manilian astrology than **C3**. Cicero's astrologers would have us believe that heaven governs events on the human plane almost like a puppeteer, with their mysterious 'forces' serving as puppet-strings that bypass all matter lying in between.⁵ For Manilius, the ultimate causal responsibility for *everything*, including the vicissitudes of weather, lies with the heavenly bodies (Chapter 1.4). To think of weather, then, as an independent power capable of rivalling that of the upper heavens makes no sense in Manilius' world.

C6. *Children evidently inherit many characteristics from their parents – not just appearance, but manners, habits and gestures. This would not happen if such things were determined by the configuration of the heavens rather than the force of the parental seed (seminum vis) (94).*

Here Cicero's target is not astrology generally, but specifically its claim that the heavens determine people's characters, manners, minds and bodies (*ingenia, mores, animum, corpus*, 2.89), all of which clearly owe more to hereditary influences than to the celestial configuration.

For Manilius, the entire series of events that lead to the birth of a child – including the passing on of certain attributes, physical, mental and behavioural, from the parents to the child – is determined by the heavens. How this comes about at a biological level has no bearing on this fact in his fully deterministic universe. Since heredity is no less subject to the will of heaven than the events of a person's life, it cannot be called upon to reveal the

5 See Chapter 1.5.

limits of stellar influence.

C7. *Birth defects such as speech impediments are often corrected by medical intervention or effort on the individual's part. If such defects had been engendered by a star then this would be impossible. Therefore they are not the result of stellar influence (96).*

Against most forms of astrology as attested later, including Manilius', this argument simply misfires: for one may simply reply that anyone who overcomes an impediment they were born with was fated to do so all along. Why proponents of astrology as Cicero understands it cannot make this retort is that it goes against the principle that not just the life-story but the essential physical attributes of an individual are determined *at birth* (*censent...pueros orientis animari atque formari...casus cuiusque eventusque fingi*, 2.89).

So, according to this view, if astrology tells us that an individual is destined to suffer from a speech impediment, then the prediction would cease to be true if and when the impediment was overcome. Cicero being our only source on the issue, we cannot know whether this argument posed a genuine problem for the astrology of his day. But if so, it offers a striking insight into the understanding of determinism in pre-Manilian astrology.

C8. *In each part of the world people display characteristics very distinctive of their region of origin – not just in body but also in mind. It is easy to run through the features distinguishing, say, Persians from Indians. Hence it is clear that local environment has a greater effect on an individual than the influence of the moon at their birth (96f.).*

2.1. Cicero's critique of astrology

Like **C6**, this argument is directed against the astrologers' claim that everything about an individual, including their minds and bodies, is formed and determined by the stars at their birth (2.89). Like **C6**, too, it does so by suggesting a more plausible explanation for phenomena attributed by astrologers to the stars, rather than by refuting their claim.

Astrology, as attested in Manilius (4.711-817) and most later authorities, provides its own explanation for characteristic differences between the peoples of the inhabited world, seeing each major region as subject to a specific sign of the zodiac. Although climatic differences are taken into account, too, in Manilius' system these are also the product of astral influence, with each climate being under the sway of the extrazodiacal constellations above it (see Chapter 1.4). In response to **C8**, therefore, Manilius can reply that the stars are, in fact, responsible for the differences between peoples.

C9. *The claims that astrology is based on many thousands of years of observations recorded by the Babylonians must be false. For (a) if the claims were true the practice would not have stopped; and (b) no source provides any evidence for these observations (97).*

Cicero is, of course, right to call into question this exaggerated claim, whose origins lie in genuine Babylonian astronomical records dating back several centuries, which reached the Greek world in the Hellenistic period. The survival of many Babylonian horoscopes, too, contributed to the widely attested myth of astrology's antiquity. False as the myth is, there

is reason to doubt Cicero's claim that no written source endorses it: for it seems that Berossus, who wrote his Greek history of Babylon in the third century BC, familiarised Greek audiences with the belief, along with Babylonian astrology generally. The testimony of Berossus, apparently backed up by the surviving Babylonian evidence, left Manilius no need to respond directly to this claim.

Cicero fares little better in contending that the practice of recording observations, if genuine, would have continued to his own day. For the astrologer need only reply that there were no grounds to continue the practice once enough data had been gathered to permit any possible horoscope. This, in fact, is precisely what Manilius does. The priests who conducted the original observations did so for an entire cycle of the heavenly bodies' movements – that is, until all returned to the positions they had been in when the process was begun (1.58-60).

There are good reasons why Manilius, a poet very fond of presenting numbers in verse, does not offer an actual figure for the number of years spent making the observations. For both the duration of the complete celestial cycle, widely called the 'Great Year', and the age of astrology were points of controversy – as well, in the latter's case, as being a point of ridicule from Cicero. Having his priests make observations for an entire Great Year also comes at a cost: one Stoic belief, shared to an extent by Berossus,⁶ saw the Great Year as commensurate with the entire life-cycle of the universe, so that the return of the heavenly bodies to their initial positions would coincide with the great conflagration and the return of all matter – observational records included – to a state of fire. The incompatibility of this view with Manilius' history of astrology surely explains

⁶ See p. 17 above.

2.1. Cicero's critique of astrology

why, despite some endorsement of the Stoic cosmic cycle (see Chapter 1.3), he alludes only ambiguously to the conflagration.

At this point Cicero claims to have stopped relating the arguments of Panaetius and to be raising objections of his own:

C10. *All those who died at Cannae shared a single fate, but cannot have been born under the same star. The same is true for all people of exceptional intellect.* (97)

Thus Cicero hopes to refute astrology's claim (89) that the stars are responsible for a person's fate and for their nature: for there have been many people who shared a single fate or character trait but cannot have the same birth chart.

This is the weakest of Cicero's arguments, as it must rely on a serious misrepresentation of astrological belief. For if, as Cicero claims (**C6**, **C7**, **C8**), astrologers hold the celestial configuration at birth responsible for *every* aspect of an individual, no two of the soldiers who died at Cannae (say) could have had the same birth chart unless they were identical in every other respect too.

In theory, then, Manilius is safe from argument **C10**. However, in the technical details he provides, he almost falls victim to it, in the following way. Manilius' astrology recognises two aspects of the birth chart as pertaining to the native's death. The first and more significant is a system of subdividing the zodiac called the 'dodecatropos' (2.856-967),

whose seventh and eighth ‘temples’ (30° divisions of the circle) are concerned with the *kind* of death (2.871-879, 948-958), and which as a whole has some bearing on the length of life (3.581-617). In each case, the predicted outcome is revealed by the positions of the zodiacal signs and planets within the circle. The *length* of life, on the other hand, is partly determined by the position of the planets in the dodecatropos (3.581-617) but also by a second factor that Manilius does not adequately clarify. At 3.560-580, directly before discussing the dodecatropos’ role in determining length of life, he lists the numbers of years that each of the twelve signs are supposed to confer, ranging from $10^{2/3}$ to $20^{2/3}$. It is hard to imagine that these signify the total lifespan predicted for the native. More likely, they may be a ‘bonus’ to be added to the total prescribed by the dodecatropos. Whether it is the sign in the ascendant that is significant, or the sign in which the Moon is located at the moment of birth, is not explained. Either way, however, the presence of a second factor is vital: for without it, both length of life and type of death would be put under the control of the same features of the birth chart. This would have the embarrassing result that the two would be directly correlated – all those who die the same way will have had exactly the same life-span – and Manilius’ astrology would fall victim to argument **C10**. Whether or not Manilius’ passage on the length of life is designed as a direct response to **C10** cannot be known, but it must suffice to say that it has no parallel in other astrological texts and is written with the vagueness of an author diverging tentatively from his sources.

C11. *If the conditions of the heavens at the birth of each animate being have a shaping influence upon it, then the same should be true of (beasts and) inanimate objects. This,*

2.1. Cicero's critique of astrology

however, is absurd. (98f.)

What Cicero seems to take exception to in particular is the idea that a moment of 'birth' can meaningfully be assigned to inanimate objects and a nativity cast for it. Hence his astonished mention of L. Tarutius Firmanus who, he tells us, went so far as to draw up a birth chart for the city of Rome, finding its sign to be Libra (98). 'Assume,' he says, 'that it matters under what heavenly configuration a child draws its first breath. Does it also follow that the sky had any influence over the bricks and cement with which a city was built?' (99). I can see only one reason why this would appear inconceivable to Cicero, namely that while it is easy to pinpoint the moment of a child's first breath for the purpose of a nativity, the same cannot be said of a city (recall that Cicero understands astrological influence to be a one-off affair at a child's birth – 2.89).

C11 is clearly directed at a very different kind of astrological world-view from Manilius', and what it assumes to be an absurd conclusion would not strike him, the full determinist, as such. First, he happily accepts that all matter, animate and inanimate, moves regularly in accordance with the heavens. Second, since this movement is regular, it should *in theory* be possible to predict what will happen to absolutely everything based on observation of the universe's matter in its current state (see Chapter 1.4). That this is currently not possible in practice is due only to a lack of observational data on which to base the prediction. Applying astrological theory developed from observation of humans to anything else, such as L. Tarutius Firmanus is said to have done for Rome, would surely have seemed no less ridiculous to Manilius than it did to Cicero.⁷

⁷ Manilius alludes to the story of Firmanus' nativity at 4.773 but commits himself to nothing more than the

C12. *Astrology is shown not to work by the sheer number of predictions made that later turn out to be wrong. (99)*

Quintus in Book 1 had passed off the errors made by all diviners as no different from those made in all practical arts, such as medicine, in which advances are still being made through trial and error (*Div.* 1.24). Argument **C9** has already rejected the idea that astrology belongs to this class of disciplines. **C12** now provides a further reason not to liken astrology to medicine – that its predictions can be seen to fail on a daily basis. Without proof of successful predictions, the defender of astrology has only one counter-argument available: that is, to blame the false predictions on incompetence or charlatanism, and to insist that a nativity, if performed and interpreted correctly, will yield true predictions.

When Manilius makes this claim – as he must – he does so with an extraordinary confidence, proclaiming that astrology works not just some of the time, but without fail (2.130-134):

sed, ne circuitu longo manifesta probentur,
ipsa fides operi faciet pondusque fidemque;
nam neque decipitur ratio nec decipit umquam.
rite sequenda via est ac veris credita causis,
eventusque datur qualis praedicitur ante.

claim that Rome was founded under Libra, to underscore the significance of the sign for Rome (*Hesperiam sua Libra tenet, qua condita Roma*): see p. 46 n. 54.

2.1. Cicero's critique of astrology

'But, lest it take a long digression to vouch for what is plain to see, the faith it keeps will create for our science authority and faith in it; for neither does our system deceive nor ever is deceived. Rightly and for true reasons trusted is the path that one must take, and the outcome follows even as before foretold.' (tr. Goold)

The lines have an important rhetorical function in their context, coming shortly before his first exposition of specifically astrological material (2.150ff.). Even so, it would be highly imprudent for any practising astrologer to make such a claim; and indeed the practice appears to have developed in such a way as to permit at least some error (Beck 2007: 91-93). Manilius, if not a practitioner himself, may not have worried about the implications of his claim for his working colleagues. What is more, if what Manilius has said about astrology's comprehensive evidence base were true, and if the universe were really as he says it is, then astrology ought really to be infallible. All the same, the sheer audacity of this claim, which must have gone against all imaginable evidence, can only be accounted for if taken as a foolhardy response to Cicero's goading.

2.2. Manilius' history of astrology: a programmatic rebuttal

Although it has at times come at a substantial cost, Manilius has successfully proofed his astrology and its underlying world-view against the attacks launched by Cicero. Anticipating these objections from his readers – many of whom would have been familiar with *De divinatione* – Manilius takes care to announce early on in his work that his own form of astrology is safe from these attacks, but without putting himself on the defensive. After a short dedication and poetological statement (1.1-24), there follows an extended

prologue of Lucretian type, containing a history of human civilisation that culminates in the development of astrology (25-113). Drawing on a rich tradition of aetiological narrative, Manilius manages not only to present astrology as the pinnacle of human achievement, but also slips in enough information about his own take on astrology, and the manner in which its evidential basis was acquired, to put to rest any scepticism that may have rubbed off on his readers from their study of Cicero. On reaching the narrative's conclusion, we are left with no doubt that Manilius is offering a new and very different form of astrology, even before the formal teaching of the subject has begun.

The first 13 lines of the narrative set out the divine origin of the science. They strike a balance between revolutionary ideas and elements already familiar from religion and philosophy. Like Lucretius in his figurative references to the conventional gods (see p. 41), Manilius takes pains to avoid alienating his reader, while still giving us a taste of the novel nature of his astrology. For Manilius, it can only be by the gods' gift (*munere caelestum*, 26) that man has come to attain such knowledge: for what mortal would dare steal heaven's secrets if the gods themselves had not wished it (1.26-29, 32)? Readers with a sound grasp of Stoic theology will already be familiar with the notion of astronomical knowledge as the gift of a benevolent God, particularly those who have encountered Aratus' *Phaenomena*. This more familiar element offers some cushioning for the blow that Manilius then deals by describing the sky (*mundus*) as that 'by which all things are ruled' (*quo cuncta reguntur*, 27). From Cicero's sketch of astrology we might expect him to say this of all *people*, but to assign control of all matter to the heavens is no small innovation within astrology. This detail alone is enough to derail several of the Ciceronian arguments

2.2. Manilius' history of astrology: a programmatic rebuttal

(**C6, C8, C11**), and it can be no accident that Manilius concludes his narrative by reiterating exactly this crucial point (112: see below).

The first men to be deemed worthy of receiving the divine gift were kings, whose minds came closest to heaven's heights (41f.: owing, one assumes, to their lofty position).

These were, more specifically, Eastern kings,

qui domuere feras gentes oriente sub ipso
quas secatur Euphrates, in quas et Nilus inundat
qua mundus redit et nigras super evolat urbes.

'who ruled under the eastern sky over wild nations – those which the Euphrates divides, and onto which the Nile overflows; where the sky returns and flies over sable cities.' (43-45)

Manilius may wish here to communicate nothing more than the geographical origins of his art in Babylon and Egypt. However, this very detail serves also to allay any concerns arising from argument **C4** that the observations on which astrology relies apply only to the place in which they were made. For if two peoples so far apart were able to make contributions to a single science, and their discoveries were consistent (and for the science still to exist we must assume that they were) then its principles and methods can be employed far more broadly. The detail also hints at an explanation of how astrologers came to understand the effect of location on the native's destiny, putting to rest any qualms about arguments **C1₂** and **C4**.

In the following stage of astrology's development, specially appointed priests gain a thorough understanding of the ways in which the heavens influence human life, and are spurred to make the discoveries by God himself (47-50).

Manilius in defence of astrology

singula nam proprio signarunt tempora casu,
longa per assiduas complexi saecula curas:
nascendi quae cuique dies, quae vita fuisset,
in quas fortunae leges quaeque hora valeret,
quantaque quam parvi facerent discrimina motus.

‘Embracing long ages in unremitting toil, they assigned to each period of time its particular events, noting an individual’s nativity and the subsequent pattern of his life, the influence of each hour on the laws of fate, and the great differences effected by small moments’ (53-57: tr. Goold).

The priests, we learn, were entirely thorough in their record keeping, noting the effects that even the tiniest change in the heavens’ arrangement has on the life of the individual. In emphasising this detail, Manilius surely has in mind argument **C1** (on twins), for line 57 is in effect a version of Nigidius Figulus’ counter-argument, cited above (p. 58), that the great changes that take place between the births of two twins are enough to account for their different destinies.

postquam omnis caeli species, redeuntibus astris,
percepta, in proprias sedes, et reddita certis
fatorum ordinibus sua cuique potentia formae,

‘After every aspect of the sky had been observed, as the stars returned to their customary positions, and the unvarying sequences of fate had assigned to each figuration of the planets its peculiar influence...’ (58-60: tr. Goold).

The priests’ observations continue, crucially, for an entire cycle of the heavenly bodies’ motions – that is, until all return to the positions occupied when the observations began.

2.2. Manilius' history of astrology: a programmatic rebuttal

The result is an exhaustive record of every possible celestial configuration and its effect on an individual born under it. Who, then, can doubt astrology's power to foretell the destiny of anyone born today? The astrological knowledge Manilius is claiming to have will work in every possible circumstance, and so, if applied correctly, will never err and fall prey to argument **C12**. We also have an answer now to Cicero's question in argument **C9**, why the Babylonians no longer continue their astrological observations: having acquired an exhaustive set, they do not need any more data.

per varios usus artem experientia fecit
exemplo monstrante viam, speculataque longe
deprendit tacitis dominantia legibus astra
et totum aeterna mundum ratione moveri
fatorumque vices certis discernere signis.

'...by repeated practice and with examples pointing the way experience built up the science; and from wide observation discovered that by hidden laws the stars wield sovereign power and that all heaven moves to the eternal spirit of reason and by sure tokens distinguishes the vicissitudes of fate' (61-65: tr. Goold).

We learn now that the observations allowed astrology to become a practical *ars* (61f.), a product of experience and repeated application (*varios usus*). After extensive study, the priests discover three things: (i) that the stars rule 'by untold laws' (*tacitis...legibus*); (ii) that the whole *mundus* (meaning either 'heaven' or 'universe') moves in accordance with eternal Reason, and (iii) that it marks out the varied course of fate with sure signs (65). In short, the priests learn that the stars' effects on earth can be distilled into law-like statements, and that heaven uses unambiguous signs to tell us what is going to happen.

While the use of *lex* ('law') here and in line 56 should not be confused with the modern metaphor of a law of physics,⁸ the legal metaphor is no less striking in its announcement that a fixed code proscribes the correspondences between events in heaven and on earth.⁹

Manilius' narrative now jumps back to the earliest stage in human development, before man acquired reason and any understanding of the heavens (66-72). We are told how he came gradually to possess the various skills associated with society (collaboration, agriculture, seafaring, trade, warfare and peace-making: 83-89) as well as magic (90-94). All of these were products of man's 'cleverness' (*sollertia*, 95) and not, it seems, reason. In Manilius' account, reason is responsible for man's intellectual curiosity, leading him to an understanding of the causes of the various terrestrial and meteorological phenomena he sees around him (96-106). Only then does reason turn man's attention to things further afield:

vicinam ex alto mundi cognoscere molem
intendit totumque animo comprehendere caelum,
attribuitque suas formas, sua nomina signis,
quasque vices agerent certa cub sorte notavit
omniaque ad numen mundi faciemque moveri,
siberibus vario mutantibus ordine fata.

'Reason ventured beyond the atmosphere to seek knowledge of the neighbouring vastness of heaven and comprehend the sky as a whole; it determined the shapes and names of the signs, and discovered what cycles they experienced according to fixed law, and that all things moved to the will and disposition of heaven, as the constellations by their varied array assign different destinies' (107-112: tr. Goold).

8 See Lehoux 2012, 47-76.

9 The unchanging nature of this code is underscored by the repeated use of *certus* 'sure' (59, 65, 110).

2.2. Manilius' history of astrology: a programmatic rebuttal

Much of what is said here merely recapitulates what has come before – a useful reminder after the long description of society's beginnings. However, two new essential details are revealed, (i) that celestial motion is entirely regular and (ii) that everything (*omnia*, 112) moves in accordance not just with divine will (*numen*) but with these regularly-moving heavens. Together these entail nothing less than full determinism of all matter – a fatal blow, as we saw in the previous section, to arguments **C3**, **C5**, **C6**, **C7**, **C8** and **C11**. What is more, the predictability of the heavens' motions and their law-like effects on the earth below means that astrologers need not depend as heavily as Cicero claims they do on imprecise visual observation, but can instead employ reason and mathematical computation (both *ratio*). This rebuttal of argument **C2** is made all the more pointed by the fact that it is *ratio*, not mere perception, that is responsible for man's intellectual achievements (97), astrology included.

Thus ends Manilius' history of society and astrology, and even a reader versed in the sceptical tradition of the Academy will have appreciated that they are up against a new and very different form of astrology, one that must be approached with a somewhat modified line of attack. We shall examine in the following chapter how the next generation of astrology's critics adjusted their response to meet the new challenge of this fully deterministic astrology.

Manilius in defence of astrology

Chapter 3: The response to Manilian astrology

The previous two chapters have shown Manilius to be an innovator in the physical theory of astrology. He has crafted his own world model, with one eye on the lookout for useful components to borrow from Cicero's accounts of Stoicism and the other on the Academic attacks of the *De divinatione*. The current chapter looks back upon Manilian astrological theory from the vantage point of later evidence, with the aim of revealing, as far as is possible, the impact of Manilius' innovations upon later astrology and his role in the debate between its critics and defenders. The results of the inquiry cast some tantalising light, too, on the kinds of insight Manilius' early readers turned to the *Astronomica* for. It will become clear that the poem's universal model made a lasting and widespread impression on astrology, at least into the second century, and that it was taken seriously as an authority on astrology's world-view.

There are serious obstacles to the study of the *Astronomica*'s reception within antiquity, most notably that no extant text mentions or cites the work explicitly. Literary allusions may be found in Lucan and extensive borrowing of technical material in the fourth-century handbook of Firmicus Maternus, but scholarship has yet to track the responses to its world-view. The evidence is elusive: few surviving astrological texts offer any real opinion on, let alone explanation of, the workings of astrological influence. The next to go into any detail on the subject is Ptolemy's second-century *Tetrabiblos*, which agrees with

the *Astronomica* in much of its technical detail but has an entirely different understanding of how the universe and astrology work. In a complete reverse from Manilius, Ptolemy embraces the inevitability of errors even in predictions correctly performed: astrological influence is just one of several factors shaping an individual's life, while shortcomings in astrology's original observational data make some degree of imprecision inevitable. Confirming the suspicions of Long,¹ we shall see that these concessions are most likely Ptolemy's own innovations: as we continue to fill in the picture of the debate between astrologers and their critics, it will become apparent that the Manilian world-view of astrology prevailed until very shortly before the composition of the *Tetrabiblos*, when a fresh volley of sceptical attacks seems to have prompted a drastic reassessment of the art's underlying theory.

The evidence for this comes from Aulus Gellius (*NA* 14.1), who claims to relate a discourse he heard against astrology, given at Rome in Greek, by the sophistic and Academically-inclined philosopher Favorinus.² While taking issue with the astrological practice of the day, Favorinus' speech strives to discredit astrology mainly by challenging the physical beliefs that underpin it. Favorinus' objections fail entirely against the astrology of the roughly contemporary *Tetrabiblos*, but very successfully reveal the flaws in the Manilian world-view – so successfully, in fact, that it is difficult not to see that world-view as their intended target. The *Tetrabiblos*, meanwhile, seems to evade the objections so nimbly and with such apparent awareness that it, in turn, can only be response to the attacks placed in Favorinus' mouth.

1 So also Long 1982, 184.

2 See Holford-Strevens 1988, 98-130,

These stages in the debate between astrologers and their critics have not yet been recognised or explored in the scholarship. Long has revealed part of the dialogue and shown that Ptolemy's astrology is proofed against the attacks of Cicero.³ Chapter 2 has disclosed one intervening stage in the dialogue: Manilius' response to Cicero. The present chapter will now go some way towards filling in the remaining gap.

3.1. Gellius' Favorinus and the provenance of his arguments

Before examining Favorinus' speech, we must address the complex issue of its quality and utility as evidence for contemporary opinion. Favorinus, a personal friend and tutor of Gellius, is a prominent but rather elusive figure in the *Attic Nights*: in many places, there is good reason to believe that Gellius is relating accurately the deeds and opinions of the man, while elsewhere he makes him a mouthpiece for an Academic-sceptical position in a conversation that could never have taken place. How much, then, are we to trust Gellius' claim to be relating, albeit in a very stripped-down manner, the genuine arguments of Favorinus, which he jotted down soon after hearing? For the present purpose, it matters only that the arguments are not simply Gellius' own fiction, with Favorinus brought in only to add colour and show off the author's skills of stylish translation. For it would be well within character for Gellius to turn to a (possibly) recondite but comparatively accessible work on astrology such as the *Astronomica* as a punching bag. It is, possible, too, that the bilingual Favorinus, versed as he was in Roman literature, did the same. In either case, we would have no way of knowing how widespread the poem's world-view was at the time.

3 Long 1982, 183f. Long recognises that Manilius' astrology is prone to criticisms that Ptolemy avoids but does not explore the matter further.

Ptolemy, mercifully, provides something of an answer. His astrology is so punctiliously tailored to counter the attacks found in *NA* 14.1 that it seems like a deliberate response, if not to Favorinus himself then to his source. Moreover, the concessions Ptolemy must make in order to meet the attacks are so severe that one cannot imagine him doing so without that prompt: for his astrology is enfeebled to a point where the utility of its predictions does not obviously outweigh the effort required in making them. Finally, the way Ptolemy engages with his critics suggests that the threat is a recent one. Had his predecessors already modified astrology's theoretical framework to meet their arguments, Ptolemy would surely not have felt the need to engage with critics as openly as he does in his preface,⁴ let alone to defend the art at the level of physical causes.⁵ That Ptolemy seems to respond deliberately to the criticisms in *NA* 14.1, then, suggests they are not just Gellius' invention, written with a copy of Manilius open in front of him, but arguments with real currency at the time of the *Tetrabiblos*' composition. There is much overlap with the arguments found in Cicero's *De divinatione* and discussed in the previous chapter, leading scholars to assume that both authors were drawing on a common sceptical stock.⁶ There is some sense to this conclusion: it can be no coincidence that Favorinus' final arguments against the efficacy of astrology (**F13-16** below) parallel Cicero's (**C10-C12**) in order as well as content. However, we shall see that the matter is more complex. Very few of Favorinus' arguments are direct analogues or even fortified forms of ones found in Cicero. Those that target similar aspects of astrological belief

4 *Tetrab.* 1.1. This is to be compared with the majority of astrological treatises, which feel no need to defend their science.

5 This should give at least some pause for thought when, in the *Almagest*, he is content to provide a mathematical model of planetary motion without explaining *why* planets move as they appear to.

6 Long 1982.

3.1. Gellius' Favorinus and the provenance of his arguments

rarely have more than that in common with their Ciceronian precedents. That there is so much overlap in subject but not content gives Favorinus' arguments the character of the third stage in a debate – of a response to a response. To speak, then, of a 'common stock' is somewhat misleading. Favorinus' arguments show an awareness of both earlier stages in the debate but are on the whole innovations. The heritage of those arguments with no parallel in Cicero is harder to trace. Gellius gives the impression that astrology was not a usual preoccupation for Favorinus,⁷ and the limited intrusion of his characteristic colourful persona into the speech suggests he is mostly relating the arguments of others.⁸

The final issue for the quality of the evidence concerns the delivery of the arguments. Whether the fault lies more with Favorinus or Gellius, unpicking the arguments of NA 14.1 is no easy task. To a far greater degree than Cicero, Gellius plays fast and free with connectives, creating the impression that he is continuing an argument when in fact beginning a new one. (Witness also the use of *ad postremum*, 'finally', to introduce the thirteenth out of sixteen arguments.) The use of apparently technical language is no less confusing and rarely specific or consistent, despite Gellius' evident familiarity with the terminology of the discipline.⁹ I make no attempt below to smooth over the resulting difficulties of interpretation, and offer discussion wherever I see room for controversy.

7 NA 14.1.2: Gellius is unsure whether Favorinus was discoursing *exercendi autem, non ostentandi, gratia ingenii, an quod ita serio iudicatoque existimaret*.

8 For a good sketch of the man and his style see Holford-Strevens 1988, 89-130 and Whitmarsh 2001, 294-303. It is possible that Gellius in slimming down the arguments (14.1.32) has stripped away the garnishes of exoticism that might characterise them more clearly as Favorinus', though unlikely, given Gellius' taste for the entertaining.

9 At 14.11 he feels compelled to offer two different terms for the planets, the widespread *erraticae* and Nigidius' *errones*.

3.2. Favorinus' arguments

Gellius introduces the speech by listing what he sees as its main points (14.2f.): that the discipline is not as old as its practitioners say; that its inventors were not those who they claim;¹⁰ that it was developed with the intention of deceiving people for profit; and that it is wrong to believe that all human matters 'are guided and ruled by the stars and planets, as if bound to them' (*tamquam stellis atque sideribus evincta, duci et regi*, 14.3). This last phrase is already couched in the kind of deterministic imagery that prevails in Manilius but is very foreign to Ptolemy, and sets the key for the kind of astrology Favorinus' opponents will be made to advocate.

As in Chapter 2, I offer in the italics below only paraphrases, not translations, of the arguments in Gellius.

F1. *It is absurd to think that, just because some earthly events (such as tides) are controlled by heavenly bodies, something as petty as a lawsuit about a partition wall 'should be steered as if bound by some kind of reins from heaven' (quasi habena quadam de caelo vinctum gubernari) (14.1.3-4).*¹¹

F2. *Even if that were possible by some divine force and reason (vi et ratione quapiam divina), a human's life is too brief to realise and understand it. The best we can do is make a few conjectures in a rather crude manner (παχυμερέστερον) with no basis in actual knowledge (scientia), as when the distance of a faraway object clouds our vision. (14.1.5)*

¹⁰ This claim is made at most implicitly: see **F6** below.

¹¹ The image of heaven directing earth as a charioteer his chariot is not Manilian, but captures the *Astronomica's* world-view well. Cf. 14.1.23, where human action is said to take place *ducentibus stellis et aurigantibus*.

3.2. Favorinus' arguments

Picking straight up from his summary (14.1.3), Gellius has Favorinus appeal first to his audience's sense of what is plausible, his example implying, presumably, that heaven would not be concerned with anything so petty. But even if it were, and a *vis et ratio divina* were responsible even for such small-scale events on earth, the process of discovering and decrypting the relevant signs in the heavens would take so long that no astrologer would live to see its completion.

Favorinus is surely attacking astrologers for wildly exaggerating the predictive powers of their discipline – something Manilius is guilty of. His boasts follow from a firm belief in a *vis et ratio divina* that permeate and guide all things, and whose workings have been made knowable to mankind.¹² F2 rightly objects that to understand the correlation between heavenly and earthly events at such a specific level would take an inordinate length of time. Not only did the foundational research of astrology focus (as they claim) on the relationship between the stars at a baby's birth and its subsequent life – that is, not directly on events such as lawsuits – but even if the complete workings of astrological influence were understood by man, to apply that knowledge to such a precise set of circumstances would require computation of an unachievable length. Astrologers should admit that they have the means to achieve, at most, a rough estimate.

This is something Ptolemy will feel he must embrace in the *Tetrabiblos*. For him, the remit of the divine is limited to the orderly movement of the heavens,¹³ while the

12 Manilius makes frequent use all three terms.

13 1.3, Loeb p. 22: 'The movement of the heavenly bodies, to be sure, is eternally performed in accordance with divine, unchangeable destiny, while the change of earthly things is subject to a natural and mutable fate, and in drawing its first causes from above it is governed by chance and natural sequence' (tr. Robbins).

involvement of other factors in shaping an individual's life and activities, and ignorance about the precise correlation of heavenly and earthly events,¹⁴ make only rough forecasts possible. Neither **F1** or **F2**, then, carries any weight against Ptolemaic astrology, but for Manilius they are far more potent. For he offers no more proof that *all* earthly events are governed by the heavens, other than that early astrological research had demonstrated it (1.110-112), leaving him vulnerable to **F1**. What is more, Manilius believes that this happens in accordance with discoverable principles (*leges*), and rarely turns down an opportunity to talk up his science's powers of precise and infallible prediction (most egregiously at 2.130-134). **F2**, then, reveals the bluster of his boasts: even in a cosmos that works as he claims, astrologers would have neither the time nor the means to make such precise predictions. As I have remarked in Chapter 2, it is unlikely that practising astrologers would have the audacity to claim that their science never errs, and that Manilius' boasts are partly for rhetorical force and partly a response to Cicero's argument **C12** (see pp. 72f.). Favorinus' first two attacks, then, are presumably directed not against practitioners but theorists, and more precisely ones espousing a Manilian model of the universe.

F3. *If men foreknew everything that was going to happen, the biggest difference between men and gods would be removed.* (14.1.6)

This possibly throwaway remark may be meant as an expansion of **F2**: only if we were immortal could we have the time to amass an exhaustive knowledge of future events.

14 See **F6** below.

3.2. Favorinus' arguments

Either way, it makes little sense outside of a Stoicising framework like Manilius'. For neither conventional Greco-Roman polytheism nor any other prevalent strains of philosophy makes the gods omniscient. In fact, the gods of epic and Epicureanism are characterised far more strongly by an ignorance of (and in the latter case lack of concern for) what is going to happen on earth. For Manilius, however, God, the rational force responsible for all celestial and earthly events, is necessarily omniscient and Man, though merely kin to God and not divine himself, can grow closer to the divine through the learning and application of astrology.¹⁵ **F3**, if intended as more than a throwaway remark, is a poor argument against astrology. But even if not, it only makes sense as an expostulation of distaste for the relationship between Man and the divine advanced in the *Astronomica*.

F4. *The observation of the stars and planets, which astrologers claim is the basis of their knowledge, is by no means clearly stable (liquide consistere). For if astrology's Chaldaean originators observed the movements of heavenly bodies and the effects they produced on earth, their art may well only work in that one place. One would expect the heavenly bodies (stellae) to affect earthly events differently in different places, just as they produce different temperatures and weather in different places. It is inconsistent to hold that the stars' effects on the mass and arrangement of so much air (corpus et habitum tam profundi aeris) vary according to place, but that their effects on humans are the same everywhere. (14.1.7-11)*

Like **C4**, the argument appeals to the idea that the sky in any one configuration must be

¹⁵ See Chapter 1.6.

sending down different influences upon different parts of the earth; and like **C5**, it looks to changes in the weather for insight into the nature of the link between the stars and earthly events. Starting from an assumption, shared by Manilius and other first-century authors, that the heavenly bodies as a group are responsible for climate and weather,¹⁶ Favorinus asks how they could affect some things as a group indiscriminately of place but not others. If all the original astrological data were gathered in just one place, how do we know that the correlations identified apply elsewhere too? Manilius may have proofed himself to some extent against this objection by making both Babylonians and Egyptians responsible for gathering the data, but as the two places are fairly similar in climate, there is still the chance that in another part of the world with very different weather, the laws of astrological influence are also very different.

Ptolemy does not respond to the epistemological challenge of **F4** – he does not tell us on whose observations astrology is based – yet his very different understanding of causation allows him to sidestep it nonetheless. For Ptolemy, influences from the heavens on earth are either specific, affecting individuals separately, or general, affecting an entire country and taking responsibility for weather, climate and natural disasters.¹⁷ Although the same set of heavenly bodies are behind both, the two are causally distinct, as shown by the fact that general influences can sometimes trump individual ones.¹⁸ There is no reason, in short, to expect the influences affecting the weather and those affecting the lives of individuals to work in similar ways.

16 See Chapter 1, 5. Note that the verbs in 14.1.9 are indicative: is Favorinus endorsing the view?

17 2.1, Loeb p. 118. This informs his division of astrology into two branches, universal (καθολική) and particular (γενεθλιαλογική, that is, concerning the individual native).

18 1.3, Loeb pp. 24-26.

3.2. Favorinus' arguments

F5. *It is possible that there are more planets than is commonly believed. Some could be too high or too bright for us to see but no less powerful than the others, so that a thorough observation of the heavens has never been possible. (14.1.12)*

This strikes no more than a glancing blow against Ptolemy, who readily admits to some imperfections in the original observations performed by the art's developers:¹⁹ in his eyes, astrology is worth pursuing nonetheless, and we do so to the best of our abilities. For Manilius too, the argument is less damning than it at first appears. For in his world-view, the heavens themselves have revealed their secrets to mankind and made possible the development of astrology. It is safe, then, to assume that heavenly bodies not visible to the developers of astrology need not be taken into consideration (a point Favorinus will tackle separately in **F6**). In fact, Manilius is quite happy to posit the existence of invisible 'southern Bears' that circle the South Pole without worrying about their possible influences – all the data required for precise astrological prediction have already been gathered. However, the real power of **F5** is to show that, once one calls into question the basic theology of Manilian astrology (as Favorinus has done in **F1**), its claims to a watertight empirical basis begin to ring hollow.

F6. *From any one land only certain heavenly bodies are visible. Granting that it was necessary (debuisset) to observe only that one set of heavenly bodies and from just that one place, no duration of observation would suffice to identify the effects caused by the movements and interactions of these heavenly bodies. (14.1.14)*

¹⁹ *Tetrab.* 1.2, Loeb p. 14.

This argument again targets the utility of the original observations that supposedly make astrology possible. Favorinus assumes, fairly enough, that the founders of astrology should have exercised some control over their evidence gathering to rule out geographical position as a further factor in determining a native's destiny. But if they did, then no length of observation could provide a comprehensive set of data usable elsewhere in the world or even in that very place. For we would not know whether the observed heavenly events produced the same effects elsewhere, nor would we have any understanding of the influences of the stars that are invisible from that one location.

Again, unless we subscribe to Manilius' theology, this argument is devastating to his system. Ptolemy's reluctance to offer details of the methods and authors of astrology's foundational research may well stem from the threat of this kind of objection.

F7. *If an apparently comprehensive set of correspondences was observed in the way Manilius describes, and the data worked into a sort of science, it is bound to fail. For the astrologers are not able to say how long the period of observations would have to be: the planets only return to their original arrangement after a virtually infinite length of time (infinito prope et innumerabili numero annorum), and it is impossible that a continuity of observation and record could last so long. (14.1.14-19)*

In his keenness to claim an exhaustive basis of research for astrology, Manilius had claimed that observations of correspondences were taken for an entire 'Great Year' – that

3.2. Favorinus' arguments

is, the length of time it takes for all the heavenly bodies to return to their original positions – but gave no opinion on the contentious issue of the Great Year's length.²⁰ **F7** now calls him out on this reticence, claiming (with good grounds) that whatever the actual figure, no single research project could be sustained for so long.

Manilius, as we saw in Chapters 1 and 2, picks and chooses his Stoic borrowings according to his needs: the need to give his science a thorough evidential grounding compels him to reject the Stoic belief that the Great Year is coterminous with the life-cycle of the universe (see p. 68). It is striking that Favorinus, while plainly focusing his attacks on a Stoicising form of astrology, makes the argument he does. Had his target been fully Stoicising, we might have expected **F7** to take the following form: 'the universe would be engulfed in flames before a comprehensive set of observations could be carried out'. Yet he makes no allusion to the belief in an *ekpyrosis* at the end of each Great Year. Here we see, perhaps better than anywhere else, that it is precisely Manilian astrology that he has in mind as he delivers his critique.

Again, Ptolemy is happy to admit that observational records are incomplete and do not cover an entire cycle, but that there is enough similarity to make some correct prediction possible.²¹

F8. *The skies are different when someone is born and when they are conceived. For astrologers to claim that a different prediction could be made about the same person [at*

²⁰ 1.58-60: see p. 68.

²¹ *Tetrab.* 1.2, Loeb pp. 14-16: 'the ancient configurations of the planets...can be more or less similar to the modern aspects, and that, too, at long intervals, but not identical, since the exact return of all the heavenly bodies and the earth to the same positions, unless one holds vain opinions of his ability to comprehend and know the incomprehensible, either takes place not at all or at least not in the period of time that falls within the experience of man'.

each time] is inconsistent with their belief that different arrangements of the same stars give different fortunes. (14.1.19)

As Ptolemy confirms, it came to be seen as ideal among practising astrologers to base a nativity on the moment of conception rather than of birth, if the former was known, ‘since the chronological starting-point of human naticities is naturally the very time of conception, but potentially and accidentally the moment of birth’.²² This trend must have begun after Manilius’ time, as he mentions only the casting of naticities at birth. The target of **F8**, then, is not Manilian astrological theory but the practice of the day.

Astrologers, in adopting the practice, open themselves up to serious objection. Their art was founded on research into the correspondences between the heavens *at birth* and the person’s destiny. If (as Ptolemy seems to suggest) the methods derived from those data were used to cast a nativity from the moment of conception, it is likely to be wrong by about nine months. There is some evidence to suggest that they felt the heavens were at conception and birth the same in the most important respect – the sign occupied by the Moon.²³ However, the positions of the other six planets are no less important for casting a complete nativity, and these are bound to differ greatly between the two points in time.

It is also possible that practitioners used the moment of conception (if known) to estimate a ‘due date’ and perform a nativity ahead of the birth. However, this would introduce another source of imprecision, as calculation of the due date could only ever be approximate. Figures such as Nigidius and Manilius stressed the importance of precision

²² *Tetrab.* 3.1, Loeb pp. 222-224.

²³ A claim attributed to the elusive Nechepso and Petosiris: see Bouché-Leclercq 1899, 376, 379; Boll-Bezold-Gundel 1926, 154.

3.2. Favorinus' arguments

in casting nativities, as even very slight differences in the heavens produce very great differences in the native's destiny. It is clear from the formulation of **F8** that the astrologers of Favorinus' day shared this opinion at least in theory, but were very ready to be inexact in their practice.

Ptolemy, once again, is happy to admit the imprecision: for him it is enough to claim that conception and birth occur under heavenly configurations 'of similar type' (3.1, Loeb p. 226) without any further explanation. The greatest astronomer of antiquity cannot simply have made a mistake on this point. Whatever he means by this exactly, the fact of the matter is that he is willing to tolerate some imprecision, either in calculating the moment of birth or in drawing up the birth chart.

F9. *If their art had any basis in truth, it should be possible to make predictions about people's characters and fortunes (including, crucially, their offspring) long before they are born – from as far back, even, as the beginning of heaven and earth, and thenceforth from a continuous sequence of indications through the generations. At a person's birth, the heavens foretell what children the person will have, and what children they in turn will have, ad infinitum. This is at odds with astrologers' claims that the fortune belonging to each configuration²⁴ is fixed to a specific individual, and that the configuration only recurs after a long age. For it seems that at any one time the heavens communicate the destinies of a possibly infinite number of people, namely everyone born at that moment and all their descendants. This imbalance (imparilitas) makes a mess of the original observations*

24 This is the surely the only meaningful rendering of Gellius' *uniuscuiusque stellarum formae et positionis sortem atque fortunam* (14.1.21).

(*observationem turbat*) and *the entire system of astrology is ruined* (*omnisque ratio disciplinae confunditur*). (14.1.20-22)

Perhaps the most obscurely worded of the arguments, **F9** seems at first to take astrologers to task for something rather insignificant: the claim that for each person there is only one configuration connected with their fate and fortune, when in fact the information must be present in many. Even if this is true, it is not obvious why it should prevent the original researchers from noting their correlations and developing a science of prediction from them. As the wording of the argument's final sentence (14.1.22) suggests, however, what Favorinus is really taking issue with is the *imparitas* between the sign and what they signify: for any fully deterministic astrologer such as Manilius, every birth chart should contain an impossibly great, if not infinite, amount of information: if it predicts the native's destiny comprehensively, it will contain the precise moment of birth for any children, from which can be derived the nativities of the children and so on. This poses potential problems for astrologers. The first is theological: an accurate and comprehensive prediction would be impossible, as it would require an unobtainable degree of precision in noting the moment of birth. What then would be heaven's rationale for encoding so much information into the sky at any one point? The other problem is metaphysical: is it right to speak, as Manilius does, of humans' destinies being fixed to specific configurations, if their destinies were already encoded into the nativity of their most distant ancestors, if not before? In a fully deterministic universe, is astrological influence the best way of conceptualising the causes of events on earth when there are more obvious physical causes

3.2. Favorinus' arguments

nearer at hand?

Given the challenges of interpreting **F9**, it is difficult to tell how directed it is against Manilian astrology specifically, though on the reading above it raises some important questions concerning that world-view's understanding of causation and divine Reason. However understood, **F9** poses no threat to Ptolemy, whose renunciation of full determinism and embrace of imprecision free his model of astrology of any such *imparilitas*.

F10. *Least bearable of all is astrologers' complete denial of independent human agency, for they attribute all human thought and behaviour to planetary motion, even our chance whims.*²⁵ *If they are right, then humans are not rational beings (λογικὰ ζῶα) but just puppets. (14.1.23)*

There are general voicings here of incredulity at full determinism: Favorinus makes a visible effort to speak of certain human impulses as products of chance, something that ought to sound wrong if the determinists are right. It is hard to imagine, however, that this is all there is to **F10**: Favorinus cannot have felt it to be a sufficiently sophisticated refutation of determinism, when the Stoics had long striven, with some success, to persuade the world that universal causal determinism could be reconciled with free will.²⁶

On its most convincing reading, **F10** aims to bring out an inconsistency in a Stoicising form of hard astrology like Manilius'.²⁷ In Stoicism proper, Reason pervades the universe

²⁵ *fortuitos repentinosque...animorum impetus recessusque.*

²⁶ On Stoic attempts to reconcile free will with universal causal determinism, see Frede 2003 and Bobzien 2003.

²⁷ That Favorinus has Stoicism in mind is suggested by the pointed quoting of 'λογικὰ ζῶα', appealing to

and guides it along its predetermined course; the greater concentration of Reason in the minds of humans gives them individual responsibility for their actions, which nonetheless form part of that great divine plan. The Stoics' interconnected, deterministic universe makes divination possible but does not make the source of the omen the cause of what it predicts, preserving the autonomous agency of any humans involved. A form of Stoicising astrology that made the stars only communicators of destiny could not be accused of inconsistency in its causal claims. Manilius, by contrast, insists on making the stars the causes of human actions while still stressing the rationality and responsibility of individuals. As we saw in Chapter 1, Manilius manages just about to avoid an inconsistency on this point, but in a way that makes the stars only indirect causes of events on earth.²⁸ **F10**, it seems, is taking him and his ilk to task for 'having their cake and eating it too'.²⁹

F11. *It makes no sense that astrologers' predictions deal only with great matters such as victories in battle, but not with small things such as the outcome of a dice or board game. If their expertise only extends to great matters, one may ask what is so great about them when compared with the truly great works of Nature. (14.1.24-25)*

Here the direct target must be practitioners of 'katarchic' astrology, the branch relating to the success or failure of specific endeavours, rather than the genethiological astrology that is the focus of most surviving treatises. There may, however, be a concealed jab at

the school's, and Manilius', belief that humans are distinguished from other animals by having reason (*λόγος*, *ratio*).

28 See Chapter 1.5.

29 To borrow Volk's phrase: see Volk 2009, 13.

3.2. Favorinus' arguments

Manilian astrology in the second, rather loosely related, sentence. For Manilius, astrology is the means offered to mankind of reconnecting with God, whom he equates with Nature.³⁰ It should surprise us, therefore, that astrology focuses its attention on human events and not on the more momentous workings of Nature, such as earthquakes and storms.

F12. *If the moment at which one receives one's destiny is so brief that no two people (including twins) can be born under the exact same sky, how can they pin down that precise moment, one we can barely grasp in our minds, if the sky moves so swiftly and changes in an instant? (14.1.26)*

As we saw in Chapter 2, Manilius' response to **C1** (twins have identical birth charts but different destinies) was in the same vein as Nigidius Figulus', that the tiny interval between the birth of two twins is enough to account for their different destinies.³¹ Favorinus now launches the fatal comeback that our observations cannot be precise enough to register the differences between the skies presiding over two very nearly simultaneous births. There is no saving the astrologers from this attack.³² Their only way out is to agree – as Ptolemy does – that the precise moment is likely to elude us, and that we will have to put up with any resulting inaccuracies in our predictions.

F13. *Many people with vastly differing birth charts and natures sometimes die the same*

30 See Chapter 1.6.

31 See p. 58.

32 On its development later by Sextus Empiricus, see Long 1982.

kind of death together in the same moment. But this should never happen if the moments of birth assigned to each of them had their own rules (leges). (14.1.27f.)

Introduced, bafflingly, as Favorinus' final argument (*postremum*, 27) **F13** looks at first like nothing more than **C10**, but there is an important refinement. Events of this kind are problematic not for the belief in astrological influence generally but for the central idea that there are recognisable and recognised *leges* (a Manilian term) underlying it.³³ If this is the case, some detail of the birth charts of all those who die in a single disaster must be the same.

Type and time of death are matters on which Manilius says little, and that only reluctantly, but it is clear he envisages a system in which the signs and planets' positions within certain degrees of the fixed circle of the *dodecatropos* determined the length of life and manner of death.³⁴ What is less clear is how he avoids a direct correlation of the two. For on a very crude system, all those who die the exact same death will have had exactly the same length of life, and therefore exactly the same moment of birth and birth chart. But this plainly does not reflect reality. We saw in Chapter 2 that Manilius seems to have made some independent effort to overcome this problem, but not in an adequately clear or convincing fashion. But even if he has avoided directly correlating length of life with type of death, Manilius must believe that any two people who meet the same end will have something in common in their nativities: otherwise fate cannot have discernible *leges*. Given the diverse origins and moments of birth, as well as the sheer number, of people who die in such

33 Following Lehoux 2012, I avoid translating *lex* as 'law' in contexts where that could give an anachronistic impression that Manilius is speaking of laws of nature in the modern scientific sense.

34 On the vagaries of both, see pp. 69f.

3.2. Favorinus' arguments

disasters, this is unlikely enough. Manilius, like Nigidius, is also committed to a view of astrology in which tiny changes in the heavens alter their influences enormously. What, then, is the likelihood that, when many people meet exactly the same end, the positions of the planets within their *dodecatropoi* can *all* have been the same?

Ptolemy's non-deterministic system of multiple causes seems to be designed specifically to escape this problem: two neighbours' birth charts may predict very different lives and deaths, but in the event of an earthquake, the general cause may trump the specific and cause both to die.³⁵

F14. *Favorinus somewhat implausibly envisages astrologers replying to F13 that such things happen to people with very different nativities as the result of some later conjunction in the heavens. But if that can happen, there should also be times at which several identical clones of (say) Socrates, Plato or Antisthenes are born, all with exactly the same character and destiny.* (14.1.29-30)

Given the relatively good understanding of astronomy that both Favorinus and Gellius show elsewhere in 14.1, it is unlikely that either could believe in the possibility of 'a later conjunction' (*stellarum pares quosdam postea conventus*) presaging some new fate not present in the original birth charts. The response, then, is either a straw man, or something practical astrologers at the time told gullible clients in answer to the question (popularised perhaps by Cicero's **C10**) concerning simultaneous deaths. The response is certainly not available to any astrologer who believes in the regularity of celestial motion, such as

35 See Long 1982.

Manilius or Ptolemy; and in an age where planetary motion was recognised as regular and accurately forecast, only a fool or (more likely) a charlatan would have made it.

Either way, the response offers Favorinus an opportunity to exploit another very real weakness of astrology identified in **C10**. For it sits poorly with Nigidius and Manilius' beloved claim that an infinitesimal difference in the heavens produces very different natives: if the heavens can sometimes hold their position long enough to produce a single effect upon several people, then we should expect there to be times at which several totally identical people are born. Astrologers, then, are in a bind: those that endorse Nigidius' claim (that the heavens change significantly from instant to instant) fall victim to **F12**; but those that do not must find an escape from **F14**. Ptolemy's way out – surely the only one available – is to renounce determinism, opening the door for his theory of competing general and specific causes.

F15. *If the time and rationale (ratio) and cause of people's lives and deaths, as well as all other human matters, lies with the stars, one would expect all animals, however tiny, to be born and die likewise by the same set of rules (legibus...isdemque itidem). If astrologers do not believe that the movements of the heavens also give fates to frogs and gnats at their birth, there seems to be no reason (ratio) why the power of the stars should hold sway over men and not the rest. (14.1.31)*

Favorinus now turns **C11** on its head: instead of taking issue with the idea of horoscopes for beasts or inanimate objects, he asks why astrologers *do not* apply (or think it possible

3.2. Favorinus' arguments

to apply) the same methods of prediction to animals.

It is not easy to envisage a form of astrology against which **F15** could pack any punch. Manilius is certainly safe: the principles of his astrology are derived, he claims, from research into correlations between heavenly movements and the lives of *humans*. He would surely not deny that the lives and deaths of all animals are determined and indicated by the stars, but without repeating the original observations for other species, one could not know whether the principles governing the lives of those species are the same as for humans.

F15 is a surprisingly weak link in Favorinus' critique. It may be that he has committed himself to reworking a full series of arguments from a specific source (as mentioned above, **F13-16** parallel Cicero's last three arguments, suggesting that the sequence is borrowed). **C11** was a weak spot in the original run of arguments, and **F15** may be the best Favorinus was able to achieve with the material available.

The most remarkable feature of **F15**, however, is the two instances of *ratio* (the first rather forced) and the expectation, again, that heavenly influence should work according to *leges*. Allusion to Manilian astrology seems most likely, even if not very appropriate; and in the case of *ratio* it seems to take the form of wordplay, as if turning the astrologers' words against them.

F16. *It is only through trickery that astrologers seem sometimes to make correct predictions.*

They rely on vagueness, a great number of guesses (so that at least some turn out to be right) and the subtle extortion of information from gullible customers. Though they

The response to Manilian astrology

therefore occasionally manage to make correct predictions, these are outweighed many times over by the ones that turn out false. (14.1.33)

This argument and its successor target astrological practice, but bear importantly too on central theoretical claims of Manilian and Ptolemaic astrology. As already mentioned, Manilius is happy to boast that his art of prediction never fails – a blunt and unsubstantiated reply to **C12** that could only come from an armchair astrologer (see pp. 72f.). For Manilius, a prediction can only prove false if the performer has erred. Most actual practitioners must have taken another line, if only to avoid making themselves objects of ridicule, but whatever it was, **F16** is sure to have been a fair assessment of their performance.

Ptolemy in his opening chapters takes on each of **F16**'s points directly: incompetent astrologers have given astrology a bad name, as have those charlatans – the majority of astrologers, in fact – who seek to deceive their clients in pursuit of gain. He stresses that there is more than mere chance behind correct astrological predictions, but that the difficulty of the task makes some error inevitable.

F17. *Knowing the future can do you no good anyway. Whether the forecast is good or bad, the anticipation will grind you down, protracting the suffering or robbing the good event of its satisfaction. (14.1.35)*

Manilius sees astrology as mankind's means of connecting with the divine: therein lies its

3.2. Favorinus' arguments

value. He shows no trace of awareness that knowledge of the future should have an adverse moral effect, though this may owe in part to his Stoicising tendencies. Ptolemy, on the other hand, is clearly aware of **F17** and devotes a lengthy chapter (1.3) to stating the opposite case. Astrology, he says, has much in common with medical diagnosis and prognosis: it brings to individuals' attention the ills that are likely to befall them if they do nothing to avoid them, but the forewarning offers an opportunity for intervention.

3.3. Conclusion

One way or another, Ptolemy was aware of and responded to arguments directed at the astrology advocated by Manilius. We have seen grounds for believing that his astrology or something very close to it was predominant in the time of Favorinus. It is tempting, therefore, to see this as evidence that Manilian astrology had a lasting impact: for, as Chapters 1 and 2 have shown, Manilius was, to a considerable extent, the architect of this astological world-view. Some supporting evidence comes from the *Astronomica's* interpolations: of those lines that both Flores and Goold, the text's most markedly opposed editors, agree to be later interpolations, the majority elaborate upon the natural philosophical, rather than the technical astrological, detail, suggesting that the former material was a greater focus of attention and seen as more worthy of clarification. There may be a grain of truth in Long's labelling of the *Astronomica's* teaching as "hard' astrology with a veneer of philosophical colouring' (Long 1982, 187), but we must be wary of underestimating the allure of that veneer for later astrologers.

The response to Manilian astrology

Chapter 4: Word and World in the Astronomica

While previous chapters have concentrated on Manilius' world-view as he explicitly presents it, the present will explore the more oblique strategies of persuasion at work in the *Astronomica*. Three such strategies stand out especially, and are the focus of the three parts of this chapter:

- (I) the shaping of the text as a model of the universe, with the form of the latter mirrored through patterns in word-order and structural devices;
- (II) the careful placing of tactical metaphor to habituate the reader gradually to more alien notions of conventional astrology that, at least at first, seem inconsistent with the Manilian astrophysics;
- (III) the use of wordplay to highlight the balancing of forces on which the universe's regularity and stability depend.

The three serve quite different functions, the first acting as a guarantee of the legitimacy of the poem's claims, and the latter two assisting the reader's transition to an astrological world-view. However, they have more than their obliquity in common: all three strategies are found in greatest concentration in the first book, shedding further light on that book's importance not just as an astronomical primer but as a vital part of the poem's greater argument.

4.1. The text as a model of the universe

In one of the *Astronomica*'s most famous passages, Manilius compares his favoured method of teaching astrology (covering the absolute basics first) with the way in which children must be taught letter-forms before they can learn how to sound them out in combination and, eventually, to read (2.755-771). In this analogy, the individual letters correspond to the various components of the heavens; their different combinations in the form of words have different meanings, just as different combinations of heavenly bodies have different significances for us on earth.¹ The school-children simile takes its inspiration from a famous Lucretian analogy in which atoms are likened to letters – sometimes more specifically to the letters of his own work – with both types of *elementa* (a Latin word meaning, significantly, both ‘atoms’ and ‘letters’)² making up the smallest parts of a greater whole and having vastly different effects in different combinations.³ Acknowledging this debt to Lucretius, Katharina Volk sees a close kinship between text and universe, claiming that ‘like Lucretius, Manilius thus implicitly presents the universe as a (poetic) text and, conversely, his text as a small universe’ (Volk 2009: 195). Taken alone, the simile of children learning to read is meagre evidence that Manilius saw his poem as a universe in miniature, suggestive as it may be. However, close reading of the poem reveals Manilius engaging in a practice that wholly supports this interpretation: the ordering of words and arrangement of lines in ways that resemble the shape and

1 On the simile, see Landolfi 1990, Schindler 2000: 252-262 and Volk 2009: 195f.

2 On Lucretius’ application of *elementum* and other linguistic terms to the organization and motion of atoms, see Dionigi 1988: 1-38.

3 Lucr. 1.196-198, 823-827, 907-914; 2.688-699, 1013-1012. On the analogy, see Friedländer 1941, Snyder 1980: 31-51, Schiesaro 1994 and Volk 2002: 100-105.

4.1. The text as a model of the universe

appearance of the cosmos. The questions of how and how much the text is made to mirror the physical structure of the universe are explored in this section, as well as what wider argumentative function such modelling should be seen to serve in the poem.

The commonest form of modelling in Manilius is the use of word-patterning to reflect the roundness or symmetry of whatever is being described. Contrasting Ursa Major and Ursa Minor, he observes that the former has a greater orbit around the North Pole, and the latter a smaller one:

maioremque Helice maior decircinat arcum

'Helice, the greater, rounds off a greater arc' (1.296)

angusto Cynosura brevis torquetur in orbe

'Little Cynosura turns around in a narrow orbit' (1.299)

The word-patterning in both lines is modelled on an Aratean exemplar, also describing Ursa Minor:

μειότερη γὰρ πᾶσα περιστρέφεται στροφάλιγγι

'For its whole form wheels around in a smaller circle' (Arat. 43)

The placing of noun and adjective at opposite ends reflects the way in which the circular path they denote enclose the rest of the line, just as the Bear's orbit encloses the pole.⁴ This is certainly the spirit in which the word-order is received by Manilius, as the two examples above confirm. Consider, also, how the same word-patterning is used to reflect

4 So Kidd 1997, 191 (ad loc.).

the position of the axis at the very centre of universe:

libratumque regit diverso cardine mundum

‘It controls a universe balanced on its opposite poles’ (1.280).

The *libratus mundus* encases the description of the axis’ function, just as it does the axis itself. The very next line, which features the same patterning, presents an even more striking case:

sidereus circa medium quem volvitur orbis

‘the middle about which the starry sky turns’ (1.281).

Here the flanking pattern is compounded with a hyperbaton that places *medium* aptly at the line’s middle, surrounded by the *sidereus orbis* on the page, just as in reality.

The continuously sloping contour of the earth’s surface finds its reflection in two different word-patterns, as if the poet is offering images of the same feature from two different perspectives. The first – chiasmus – is a natural choice, capturing the symmetry of the earth’s rounded surface :

semper et ulterior vadentibus ortus ad ortum

occasumve obitus

‘Dawn is always further away to people travelling towards it, as is sunset to people travelling towards sunset’ (1.192f.).

nec patulas distenta plagas, sed condita in orbem

4.1. The text as a model of the universe

undique surgentem pariter pariterque cadentem.

'Nor is the earth stretched out into wide tracts, but is formed into a sphere, rising equally and falling equally on all sides' (1.204f.)

Compare the latter, in particular, with a rather different illustration of the earth's curved form, 35 lines later. Manilius tells us that the southern hemisphere believes itself on top of the world, with the ground hiding its gradual curve

et pariter surgente via pariterque cadente

'and with a path equally rising and equally falling' (1.241).

Here the symmetry of the curve reflected not in chiasmus but in parallelism (*pariter surgente...pariterque cadente*), as if we are presented with the earth's curvature from a different aspect.

In the description of the entwined constellations of Ophiuchus and Serpens, convolutions in the word-order play a similar role of modelling on the page what the words describe:

serpentem magnis Ophiuchus nomine gyris

dividit et torto cingentem corpore corpus

'One called Ophiuchus holds apart the serpent which with its mighty spirals and twisted body encircles his own' (1.331f.: tr. Goold)

Again the text acts as an image: just as in a diagram of these constellations, the eye must wander between the different interwoven parts before it can comprehend the whole.⁵ The

5 This is also true, on a far grander scale, of Manilius' tour of the constellations as a whole. For as with

same type of modelling occurs also at 1.247-250, lines that describe the universe's composition from the different elements:

hoc opus immensi constructum corpore mundi
membraque naturae diversa condita forma
aeris atque ignis, terrae pelagique iacentis,
vis animae divina regit

'This fabric which forms the body of the boundless universe, together with its members composed of nature's diverse elements, air and fire, earth and level sea, is ruled by the force of a divine spirit' (tr. Goold)

It is only at 250 that the verb and subject of the sentence are revealed and we learn that the complicatedly structured 247f. express its objects: the equally intricate world and the interwoven elements that the divine spirit governs.

In a less conspicuous form of modelling, Manilius limits the number of lines in a passage to a relevantly significant number, most notably in the twelve-line tour of the twelve signs of the zodiac (1.263-274). Even writing on a subject like astrology, Manilius' material can have offered him few opportunities to employ this device, and this may be the only certain instance. A second possible case is the 30-line passage on the dodecatemories, or 30-degree division of the zodiac, at 2.693-721.⁶ Although Manilius' treatment of the dodecatemories does not end there, what follows is merely an alternative method for calculating them. It may also be no coincidence that the seven-line opening sentence of Book 5 has as its main preoccupation the seven classical planets, whose names

any extended piece of *ekphrasis*, there is an engaging similitude between the way in which the reader is gradually enabled to visualise an object through piecemeal description, and the way the mind of an observer comes to appreciate the whole of the described object through examination of its parts.

6 The count includes 2.642, which Housman and Goold place, quite plausibly, after 706.

4.1. The text as a model of the universe

it lists.

However, by far the most striking – and extensive – form of word-modelling in the *Astronomica* are the acrostics. More acrostics have been found in the poem than in any other classical text.⁷ Of course, this particular device has literary functions other than modelling. Acrostics serve, first, as generic markers, aligning the work with the traditions of didactic poetry – with which acrostics are most strongly associated –⁸ and, more specifically, of Aratean astronomical poetry, since the *Phaenomena* came to be seen as a fountainhead of the acrostic trend.⁹ The acrostic, therefore, also offers Manilius a means of emulation: by exceeding his Aratean predecessors both in the number of his acrostics and their degree of experimentation, he marks his work as not just another Latin version of the *Phaenomena*, but as superseding even the original.

In a work in which passages of the text are demonstrably designed to mirror the form of the universe, it is only reasonable to see acrostics as part of the same endeavour. As an astrologer, Manilius delights in finding meaningful patterns in the apparently random, such as the groupings of stars into astrologically significant shapes (see Chapter 1.7) and the correspondences between events in heaven and on earth. Such patterns are not just out there for us to find in the wider universe, but also hidden in the left-hand margin of this microcosmic poem.

7 The list of recognised acrostics continues to grow. I present here a list of those deserving of credence, along with their discoverers: 1.263-5 & 275-279 **ARS...AONIA**, and 1.344-340 **RESPIC(IT)** with line-initial *respicit* in 334 (Bielsa i Mialet 2000b); 1.705-710 **AQVA**, with line-initial *quam* in 705 and 710 (Bielsa i Mialet 2000a); 1.798-801 line-initial *Aemilia* begins a partial acrostic **AEMI** whose last line opens with I[u]LIA (Feraboli-Scarcia 1996-2001: vol. I, xviii-xix); 1.813ff. **SPARSV** (Colborn 2013; see also below); 1.846-850 **LEPTE** (Danielewicz 2013, 290); and possibly also 2.93-97 **SAETA** (Damschen 2004; see n. 16 below).

8 On the development of the acrostic and its generic affiliations, see Courtney 1990.

9 The association is revealed most tellingly by Silius' unimaginative acrostic, ARATeA (*Pun.* 15.559-563).

Manilius' set of acrostics contains some peculiarities that raise interesting questions about the more precise function of the device in his work. First, there is a baffling near miss, **RESPIC(I)T** at 1.334-340, spanning the descriptions of the constellations *Serpens* and *Cygnus*:¹⁰

RESPICIT ille tamen molli cervice reflexus
Et redit effusis per laxa volumina palmis.
Semper erit, paribus bellum quia viribus aequant.
Proxima sors Cyncni, quem caelo Iuppiter ipse
Imposuit, formae pretium, qua cepit amantem,
Cum deus in niveum descendit versus olorem
Tergaque fidenti subiecit plumea Ledaee.
nunc quoque diductas volitat stellatus in alas.

'But, bending its supple neck, the serpent looks back and returns; and the other's hands slide over the loosened coils. The struggle will last for ever, since they wage it on level terms with equal powers. Hard by is the place allotted to the Swan: Jupiter himself placed it in the sky as a reward for the shape with which he snared the admiring Leda, when, a god changed into a snow-white swan, he came down and offered his feathered form to the unsuspecting woman. Now too with outspread wings it flies among the stars.' (tr. Goold)

As in the archetypal Λ EIT Θ -acrostic in Aratus (Arat. 783-787), the acrosticised word is also the first word of the top line, forming a right angle. Here the orthogonal formation is rather apposite, resembling the form of *Serpens* as it appears on early globes,¹¹ with its long body bent rightwards (*molli cervice reflexus*, 334) in a right-angle, as if looking back

10 Bielsa i Mialet 2000b. I am not convinced by the author's claim that the word forms part of a sequence, **ARS AONIA RESPIC(I)T MVSAS**, comprising three acrostics (263-265, 275-279, 334-340) and one 'telestich' (343-347).

11 On the likely interactions between Manilius' text and contemporary graphic representations of the heavens, see Thiele 1898: 45-47 and my Appendix.

4.1. The text as a model of the universe

at the figure holding it (hence *respicit*).



Figure 1. Detail of Ophiuchus and the orthogonal Serpens, as depicted on the globe of the second-century Farnese Atlas, from a projection by Foulkes Stich printed in Bentley 1739. The globe is believed to be a copy of a Hellenistic original.¹²

What is so strange here, though, is that the acrostic is a letter short, spelling only RESPICT. There is no reason to suspect a lacuna after 339, and it is difficult to imagine that Manilius could not have composed and inserted another line there beginning with ‘T’, had he wished to. Why, then, did he not? If I am right to suggest that Manilius’ acrostics are verbal models of the meaningful patterns awaiting discovery in the universe at large, and that in this instance the acrostic mimics the form of Serpens, then I would make one further, tentative suggestion: that the omission of the vowel is a nod to the incomplete nature of the constellations. For Manilius, the fact that the constellations exist only as partial outlines of the things they resemble is cosmologically significant: Nature, he says, could not cope with having so much fire in the heavens as would be needed for the figures to be depicted in full (1.461-465),¹³ and has left it up to us to fill in the rest in our minds

¹² On the dating and design of the Farnese globe and its original, see Duke 2006 and Künzl 2005, 63-66.

¹³ On this matter, see Chapter 1.2.

(467f.). Likewise, RESPICT becomes a meaningful word once we fill in the missing part in our minds. Manilius, a keen-eyed imitator of acrostics, may have drawn inspiration from an earlier near miss, Nicander's not-quite-signature at *Alex.* 266-273.¹⁴ That Hellenistic example may be no more than an abandoned attempt at an acrostic, but may have prompted Manilius to put a deliberately incomplete acrostic to use as a modelling device.¹⁵

Even more unusual is Manilius' borrowing of acrostics from other astronomical poems, a trend that has only very recently come to light.¹⁶ Most striking is Jerzy Danielewicz' discovery of the aforementioned ΛΕΙΤΗH-sequence from the *Phaenomena* transliterated and acrosticised at 1.846-850:¹⁷

Lampadas et fissas ramosos fundit in ignes.
Et tenuem longis iaculantur tractibus ignem 849
Praecipites stellae passimque volare videntur. 847
Tum vaga per liquidum scintillant lumina mundum
Exsiliuntque procul volucris imitata sagittas, 850

'Or it may produce torches which are split into several branches of flame. There are also shooting stars, which hurl long trails of slender fire and are seen flying everywhere, when wandering lights flash through the clear sky, and dart afar like winged arrows...' (tr. Goold)

14 ΣΙΚΚΝΔΡΟΣ. Contrast the more successful ΝΙΚΑΝΔΡΟΣ at *Ther.* 345-353. On both signatures see Lobel 1928, 114.

15 Taken as deliberate red herrings, near misses could be seen as serving another modelling function: the normally easy task of acrostic-hunting becomes more of a challenge, reflecting more faithfully the difficulties of finding meaningful patterns in nature.

16 Aside from those discussed below, there is one further likely example, 2.93-97 SAETA. Damschen 2004, 109 observes that the sequence, which occurs in a passage on the Moon, may be an attempt of Manilius' to make sense of the meaningless sequence ΣΑΑΕΤα at *Arat.* 778-782, also from a passage on the Moon. Manilius, seeing in it the Latin word *saeta* 'bristle', may have taken it as a fortuitous reference to the Moon's corona or *cornua* (2.103).

17 Danielewicz 2013, 290. Note that the validity of the sequence relies on Goold's (wholly plausible) re-ordering of the lines, and an emendation of 848 *cum* to *tum*, for which Danielewicz offers convincing independent justification in a forthcoming article.

4.1. The text as a model of the universe

Notably, Manilius has not just borrowed the acrostic but has housed the word in a passage to which its sense is relevant, with λεπτή ('fine, delicate') picked up by its Latin equivalent *tenuis* in 849. This desire for his acrostic to make sense can easily be explained as part of the imitation, for the same is true of the original Aratean passage, which opens with the word λεπτή (803). It is more remarkable when, at 1.813-818, he does the same thing with a purely accidental acrostic borrowed from Germanicus' *Aratea*:¹⁸

Sunt etiam raris orti natalibus ignes,
P
rotinus et rapti. subitas candescere flammās
Aera per liquidum tractosque perire cometas
Rata per ingentis viderunt saecula motus.
Sive, quod ingenitum terra spirante vaporem
Vmidior sicca superatur spiritus aura,

'For there are fires born at infrequent intervals and forthwith swept away. In times of great upheaval rare ages have seen the sudden glow of flame through the clear air and comets blaze into life and perish. Maybe the earth breathes forth an inborn vapour, and this damper breath is overpowered by an arid air...' (tr. Goold)

In its original context (Germ. 118-123), the word *sparsu*, supine of *spargo* 'I scatter, sprinkle', bears no relation to the content of the passage housing it and, as its discoverer Hilberg recognised,¹⁹ can be nothing more than a coincidentally meaningful sequence of six common word-initial letters. Nonetheless, it clearly caught the eye of Latin verse's most dedicated acrosticist, who has rehabilitated it in a passage to which its sense is more

18 For more detailed discussion of the borrowing, see Colborn 2013.

19 It appears, at least, in his catalogue of accidental acrostics in Latin poetry (Hilberg 1899-1900).

pertinent: a description of meteors.²⁰ This repatriation is, I suggest, part of Manilius' modelling of his text on the cosmos. For, as we have seen, one of the unique features of Manilius' universe is that everything within it has its purpose and everything makes sense (Chapter 1.2). Even phenomena that are typically awarded no astrological significance, such as meteors and comets, have their place in the Manilian system. Likewise, a sequence of letters that was once just a product of chance is given meaning in Manilius' microcosm.

Two clear points emerge from these findings: first, and more obvious, Manilius has gone to great effort to ensure that passages of his poem formally reflect the physical structure of the universe. The second is that the examples of this modelling, though not confined to the first book, are found in it in far greater concentration than in the rest of the poem.

Let us now take on the task of interpreting these observations. In doing so, we must ask several questions: need we see these figures as anything more than part of a literary game, in emulation of the *Phaenomena*-poets and Lucretius? Is their function ever to assist the reader in visualising what is described? What philosophical purpose, if any, do they serve?

The direct imitation of Aratean acrostics and the ambitious experimentation with the device is proof enough that emulation and generic conformity matter to Manilius. The concentration of acrostics and Aratean word-patterning in the first book could be

²⁰ Manilius here has falsely conflated comets and meteors (shooting stars). The acrostic may allude either to the scattered distribution of the meteors themselves during meteor showers, or to the particulate material that gives them birth, which he goes on describe in the following lines: *quia non solidum est corpus, sed rara vagantur | principia aurarum volucrique simillima fumo, | in breve vivit opus* (1.823-825).

4.1. *The text as a model of the universe*

explained, moreover, by reference to that book's common content with the *Phaenomena*. As important as these concerns are, however, they do not suffice to account for the modelling of text on universe. Large stretches of Book 1, including the cosmology, have no precedent in Aratus and yet contain numerous instances of word-patterning, telling against the idea that such devices only appear when Manilius is 'playing Aratus'. Moreover, as the schoolmaster-simile (2.755-771: see above) reveals, Manilius has taken on board the philosophical and didactic significance of the Lucretian analogy between text and world. It falls to us, then, to look for corresponding significance in the connections he himself makes between the two.

Word-patterning holds potential as a didactic aid in its ability to turn a verse into a diagram. The idea is appealing, but in fact the didactic potential is limited: at any rate, of the examples of word-patterning listed above, the ideas they illustrate are never so complicated that a diagram is of much use. In fact, more effort is required of the reader to recognise the significance of the words' ordering than their meaning. It is much easier to suggest a didactic purpose for the acrostics: as is discussed in greater detail in Chapter 5, one of the fundamental claims of the *Astronomica* is that, despite first appearances, everything in the universe makes sense as part of a grand design (see also Chapter 1.2). The grouping of stars into outlines of familiar objects is by no means arbitrary, but essential to the understanding of their influences (see Chapter 1.7). The acrostic is a similar phenomenon, therefore, to the constellation – an example of a meaningful pattern in the seemingly random – and serves as an effective illustration of the fundamental claim that meaning is written into the design of the heavens.

While it may be hard to pin specific didactic functions on Manilius' use of world-modelling, it is at least clear what philosophical importance the correspondences between text and universe have for him. We have seen in Chapter 1.6 that for Manilius man is a microcosm – a universe in miniature – by virtue of his being both guided and designed by divine Reason (*ratio*), just as is true of the universe itself. Manilius has us reflect at 4.886-921 that man's structural similarity to the universe,²¹ his possession of Reason and his consequent curiosity regarding the heavens all serve as proof of a kinship between God and man. By ensuring that his poem bears the same hallmarks of divine kinship – structural similarity, preoccupation with the heavens, and manifestation of the divine Reason²² – he bestows much greater credibility upon his claim to be singing a song that has come down to him from the heavens (see below), a claim upon which the legitimacy of his whole enterprise is predicated.

The modelling, therefore, serves a crucial persuasive role, encouraging the reader to see the poem as a microcosm like man: an artefact and vessel of the divine Reason. Once this role is acknowledged, the concentrated deployment of modelling in the first book comes to make more sense, winning the reader's faith in the poem's authority and credibility at as early a stage as possible.²³

Lastly, given the vital role that modelling plays in the *Astronomica's* didactic mission, I suggest rereading 1.25, the closing line of the work's proem, thus:

21 See Chapter 1.5.

22 It is surely significant that Manilius uses the same word, *ratio*, to denote both the divine Reason and his astrological system: see comm. on 1.261.

23 For a number of other possible, more subtle instances of word-modelling in Manilius, see Hübner 2011, 142-155.

4.1. The text as a model of the universe

certa cum lege canentem
mundus et immenso vatem circumstrepit orbe
vixque soluta suis immittit verba figuris.

'Heaven in its vast rotation resounds around the poet, who sings to a fixed measure, and *sends into him words scarcely detached from its (heaven's) configurations.*' (1.23-25)

As at 1.118, Manilius presents his song as coming down to him from heaven. Here, however, he tells us that the words come to him in arrangements barely differing in structure from the arrangements (*figurae*) of the heavens – a programmatic announcement, perhaps, of his poem's likeness to the universe it describes.²⁴

4.2. Habituation through metaphor

While it appears that Romans of all ranks were attracted to the general idea of astrology, there are certain aspects of conventional astrology that many would have found harder to swallow, particularly in combination with the model of the universe presented in the *Astronomica*. Most difficult, perhaps, is the idea of hostilities between heavenly bodies: Manilius tells us repeatedly that his universe is one in which a divine force, concentrated in the heavens, unites the parts of the universe into a consonant, orderly whole. Although

24 The sentence is open to a variety of interpretations, as Volk has recognised (2002: 240f.). What is offered here, however, is entirely new. There is reason to doubt Goold's reading of 1.24, which takes *figuris* in its linguistic sense (either 'inflected form' or 'phrasing'), has *suis* refer to *verba* and takes *suis...figuris* as the dative indirect object of *immittit*. Indeed, *certa cum lege canentem* (22) gives some plausibility to an interpretation of 24 that focuses on the challenges of versification. On the other side, van Wageningen (*ad loc.*), Waszink 1956 and the Feraboli-Scarcia take *figura* in one of its commoner Manilian senses: as a celestial configuration. Waszink shares van Wageningen's objection that *suis* must refer to the sentence's subject, not to the *verba soluta*. I do not see why this need be the case, as the pronoun could just as easily refer to the internal 'subject' of this participial phrase. At first blush, moreover one would expect *vix* to modify *soluta*, its neighbour, not *immittit*. Lastly, *soluta suis...figuris* makes good sense taken together, with *solvo* followed by a bare ablative of separation.

this is not necessarily inconsistent with the notion of heavenly bodies in conflict (see Chapter 1.5) it certainly appears so at first sight. For if God is the embodiment of Reason, why should parts of the divine be in conflict with each other? This question is not directly addressed in the *Astronomica* and, as we have seen (Chapter 1.5) Manilius himself does not make clear whether he is committed to the belief that heavenly bodies are actually ever in conflict, or whether he speaks of the conflict only as a metonymy of the earthly conflicts that certain celestial relationships engender. What is certain, however, is that the language of conflict is ubiquitous in conventional astrology and that Manilius is at pains to prepare his readers accordingly, so that they too can talk – and perhaps even think – in such a way.

Manilius first teaches us of alliances and hostilities among the heavenly bodies in Book 2. He eases us gradually into an acceptance of the idea by telling us first of alliances (270ff.), secondly of weaker unions (358ff.), followed by the total absence of friendship (385ff.): he only begins to speak of outright hostility at 395-401, once we have had over 100 lines to come to terms with the idea of celestial federations. The real groundwork, however, has already been laid in the first book, in the form of a string of metaphors variously describing the planets as in conflict with the signs of the zodiac, or with the rest of the sky (*luctor*, 'I struggle'; *contra nitor*, 'I strain against', *pugno*, 'I fight'):

1.259	alia adverso luctantia sidera mundo
309	per bis sena volant contra nitentia signa
805	sunt alia adverso pugnantia sidera mundo
670	quinque adverso luctantia sidera mundo

4.2. *Habituation through metaphor*

Before beginning his teachings on the relationships between signs, Manilius slips one final and more colourful example into his review of the works of Hesiod, in the prologue to Book 2:

2.119 aeternum et stellis adversus sidera bellum
 'the eternal war of the planets against the stars'.

All of these remarks have an astronomical rather than an astrological prompt. For they describe the phenomenon of apparent retrograde motion, in which the planets appear for a certain period to move from east to west, while the rest of the sky appears to rotate eastwards. This is indeed one of the most distinctive features of the planets as perceived from earth. Even so, it is striking that so much emphasis is placed on the fact, not just because planets appear to retrogress for only a minority of the time; more importantly, none of the subsequent references to the planets include a metaphor of conflict. Most telling is 3.155, which speaks much more plainly of retrograde motion (*stellae per signa sequentes*, 'planets proceeding through the signs'). It makes most sense, therefore to identify a special purpose behind the metaphors of conflict in the earlier instances – to pave the way for the *prima facie* problematic idea of war in heaven.

It is worth asking, still, how the reader is to know that metaphorical expressions quoted above are not to be taken literally. Readers familiar with Aratus will already be aware that the planets do not move in step with the rest of the sky (Arat. 454-461). But even the most astronomically ignorant reader is not in much danger of confusion, since Manilius is careful to include a more explicit expression of retrograde motion in the

poem's prologue:

(iuvat) signa...et adversos stellarum noscere cursus

'(It is a pleasure) to know the signs and the contrary courses of the planets' (1.15)

The figurative nature of these expressions is underscored further at 1.670f., where the planets are not only said to be struggling against the opposing heaven (*adverso luctantia... mundo*) but also, contradictorily, to perform varied dances in accordance with nature's law (*exercent varias naturae lege choreas*). This pairing of expressions which, taken literally, are inconsistent reminds us of the metaphoricality of the former.²⁵

Of course, this use of metaphor does not entirely disarm the hostilities of their power to surprise and confuse the reader. It does, however, go some way towards *habituating* us to talk of celestial conflict – that is, reducing its shock-value through repeated exposure.²⁶

4.3. Paradox and polyptoton

Though Manilius may not commit to a literal interpretation of the conventional language of heavenly hostility, he openly embraces the idea of opposing forces within the universe – forces whose perfect balance guarantees the stability of the universe and the regularity of celestial motion. For Manilius, this balance is achieved through the interconnected nature

25 For Manilius *mundus* and *natura* are to an extent synonymous, making the idea of waging war against the one and acting in accordance with the other's law all the more jarring.

26 It is worth recalling, too, that in practical terms it is only the talk that matters: readers will be equally well equipped for further astrological learning regardless of whether they take Manilius' expressions of hostilities literally or just as metonymies of their earthly effects. For readers inclined to treat them as literal, Book 1 affords further preparation in the description of the constellation Ophiuchus, the snake-bearer, whose war with the snake will last forever 'since they wage it with equal strengths' (1.336). The example reveals that tension in heaven need not be a disruptive force but can play a role in maintaining balance and regularity.

4.3. Paradox and polyptoton

of the universe and reciprocal interactions between its component parts. At the lowest level, this is manifested in the two-way process of elemental exchange (see Chapter 1.5) and the uniting and coordinating effect of the immanent divine force (Chapter 1.2). Higher up, it is observable in various aspects of the Manilian cosmos, and is typically underscored by some sort of wordplay or paradoxical expression, encouraging the reader to pause and reflect on the reciprocal nature of the interactions. For instance, the stability of the earth at the centre of the universe is made to depend on the fact that the whole *mundus* (here probably 'heaven') is at once both fleeing from and falling towards the centre, not just that this is happening evenly all over (1.168-70; see comm. ad loc.):

idcircoque manet stabilis, quia totus ab illo
tantundem refugit mundus fecitque cadendo
undique, ne caderet medium totius et imum.

'And it remains stable for the reason that every part of the firmament is equally distant from it, and, by falling from every direction, has made it impossible for its central and lowest part to fall.' (tr. Goold)

While this paradoxical detail draws our attention to the contrary forces, another highlights their effect: the centre (*medium*) and bottom (*imum*) of the whole are one and the same point (cf. the similar 1.167).

In a passage contrasting the habitable zones of the northern and southern hemispheres (1.236-246), another paradoxical expression offers an opportunity to be reflected on the distinct and yet interconnected nature of the universe's parts:

pontus utrosque suis distinguit et alligat undis (1.246)

'The ocean separates and binds both with its waves.'

Taken on its own, the wider implication of this paradoxical *iunctura* is not obvious; but in combination with other such expressions, it forms part of a sustained and subtle argument that the parts of the universe are interconnected and remain stable through their reciprocal interactions. When Manilius comes to state this very point, it is notable that he chooses to do so in a similar, if not quite paradoxical, manner (1.253-255):

mutuaque in cunctas dispensat foedera partes,
altera ut alterius vires faciatque feratque
summaque per varias maneat cognata figuras.

'[God] arranges mutual bonds between all its parts, so that each may furnish and receive another's strength and that the whole may stand fast in kinship despite its variety of forms.'
(tr. adapted from Goold)

Numerous expressions of this kind are worked into the tour of the extrazodiacal constellations (1.294-442) – a Manilian innovation that sets his tour apart from its Aratean model. At the very outset, the descriptions of the Bears and Draco house the first three examples (303-307):

nec paribus positae sunt frontibus: utraque caudam
vergit in alterius rostro sequiturque sequentem.
has inter fusus circumque amplexus utramque
dividit et cingit stellis ardentibus Anguis,
ne coeant abeantve suis a sedibus umquam.

'They are not set face to face: each with its muzzle points at the other's tail and follows one that follows it. Sprawling between them and embracing each the Dragon separates and

4.3. Paradox and polyptoton

surrounds them with its glowing stars lest they ever meet or leave their stations' (tr. Goold).

Two pairs of paradoxical *iuncturae* express the position of Draco, 'separating and surrounding' the Bears (*dividit et cingit*),²⁷ and its job maintaining the eternal arrangement of the constellations by holding the Bears in place (*ne coeant abeantve*). Each Bear, meanwhile, 'follows the one that follows it' (*utra...sequitur....sequentem*). The paradoxical polyptoton, borrowed from Verg. A. 11.695, is not just another instance of balance through reciprocal forces, but also leads us to reflect on the unending rotation of the heavens – another crucial guarantor of stability in the Manilian universe (2.80).

Manilius treats the entwined constellations of Ophiuchus and the Serpent as opportunity for a replay of a *iunctura*, *dividere et cingere*, this time with the added complication of a polyptoton (331f.):

serpentem magnis Ophiuchus nomine gyris

dividit et *torto* cingentem corpore corpus

'One called Ophiuchus holds apart the serpent which with its mighty spirals and twisted body encircles his own' (tr. Goold).

Unlike the earlier *iunctura* (306 *dividit et cingit*), the contrary verbs here have different agents, underscoring their opposition even as the polyptoton (*cingentem*) *corpore corpus* mirrors their union. The convoluted word-order, too, not only matches the sense, but can be seen as another instance of the text acting as a model of the universe it describes. What is most striking about the passage, however, is the concluding detail – another Manilian

²⁷ Manilius rephrases the *iunctura* in his later description of the imaginary southern Bears as *uno distingui....claudique Dracone* (452, 'separated and enclosed by a single Dragon').

invention – that neither will ever gain the upper hand (336):

semper erit, paribus bellum quia viribus aequant

'It will always be this way, since they balance their fighting of the war with equal powers.'

Once again, contrary forces serve to maintain the stability of the whole. Readers who later find themselves disturbed by the thought of strife among the heavenly bodies can call to mind the case of Ophiuchus as evidence that tension in heaven can play a sustaining rather than a disruptive role.

As with the first two oblique strategies, the third has further instances throughout the poem, each case adding to the cumulative argument that the stability and regularity of the universe – on which astrology relies for its prognostic power – are results of the interconnectedness of its parts and the mutual interactions between those parts. Like the first two again, however, it is most concentrated in the first book – specifically in the cosmology and the tour of the constellations. That Manilius makes a clear effort to work several instances of this un-Aratean feature into his catalogue suggests that it has some function beside its basic ornamental appeal.

Uncovering these three oblique strategies casts new light on the argumentative function of the first book, and reveals a poet going to great lengths to make us as receptive as possible to his teachings, both cosmological and astrological. They serve not just as examples of the poet's craft, but as proof of the seriousness of the *Astronomica's* didactic mission.

Chapter 5: Manilius on the nature of the universe

In Chapter 1 we saw how the *Astronomica* contains a carefully tailored and internally consistent model of the universe. Chapter 2 explored further how the poem's world view is shaped by a desire to respond to criticisms of astrology and offer a theoretical basis for the discipline that can stand up to them. The seriousness of Manilius' intent to develop and communicate this world view is underscored further by the reactions to it explored in Chapter 3, and by the various oblique strategies used to reiterate key points, as seen in Chapter 4. Whatever sense we choose to make of the poem as a whole, a clear picture has emerged of the *Astronomica* as a serious piece of natural philosophical teaching, one that lends credit to the more charitable approach I have taken to the poem. Indeed, it seems impossible in the light of the preceding chapters' discoveries to entertain a reading of the work that did not give considerable pride of place to this natural philosophical teaching.

The aim of the present chapter is to advance a new reading that makes the best sense of the *Astronomica* as we have it, reassessing the challenges that have plagued earlier attempts at interpretation. I shall not attempt to de-problematise fully what is undeniably a puzzling text, but to show that by seeing the communication of its natural philosophical message as its principal goal, and by taking full account of its uniqueness among ancient astrological texts, we are left with a far more coherent and compelling piece of teaching than emerges from any earlier reading of the poem.

5.1. What the *Astronomica* promises its reader

One of the supposed faults for which Housman most famously ridiculed the *Astronomica* is its failure to teach us how to *do* astrology: ‘I defy anyone to cast a nativity from the information in the poem as it stands’ (Housman 1903-30: vol. I, lxxii). Several features of the poem suggest this as its principal goal, not least the masses of small-scale technical detail, of no obvious use to anyone except aspiring practitioners. In his very first line, moreover, Manilius, promises to share with us the ‘god-given arts’ (*divinas artes*) of astrology, the noun *ars* leading us to expect practical rather than merely theoretical instruction. Occasionally, too, Manilius addresses his readers as if assuming they hope to carry out astrological predictions themselves one day. The most direct of these follows the list of the sign’s tutelary deities (2.448-452; cf. the rather vaguer 3.393-4):

hinc quoque magna tibi venient momenta futuri,
cum ratio tua per stellas et sidera curret
argumenta petens omni de parte viasque
artis, ut ingenio divina potentia surgat
exaequentque fidem caelo mortalia corda.

‘Hence will come to you the great mo[ve]ments of the future when your *ratio* courses through the planets and stars seeking the proofs and ways of our art, so that a divine power may rise in your intellect and mortal hearts may win faith no less than heaven does.’ (tr. adapted from Goold)

As Volk observes, however, such passages are few, and the poem’s instructional material is too limited to equip us for making predictions.¹ In fact, the text as it stands does not let us

1 Volk 2009, 261.

5.1. What the *Astronomica* promises its reader

take even the most rudimentary steps towards casting a nativity, omitting some crucial details and confusing others. At this point one could leap to the poet's defence and point out that neither of the earlier great 'how-to' poems in the didactic tradition, Hesiod's *Works and Days* and Virgil's *Georgics*, gives the reader enough instruction to embark on a successful agrarian life; and yet their teacher-narrator figures still come across as serious in their ambition to teach the addressees, offering at least a sketch of what the farmer's life entails. The *Astronomica*, on the other hand, mostly comprises a set of unconnected, small-scale pieces of information which, even when taken together, give hardly any idea of what it is to be an astrologer. As it stands, Manilius' poem simply fails as a beginner's guide to astrological practice.

On these grounds, Volk sees the *Astronomica* as less like a textbook than a modern coffee-table book² – that is, one from which it is possible to learn, but which most readers are likelier just to skim through, revelling in the idea of a subject and taking pleasure in having their curiosity piqued without getting bogged down in the details. The *Astronomica*, for Volk, is therefore 'not really about how to do astrology, but about the idea of astrology itself' (Volk 2009: 181). We can delight in Manilius' skills as a versifier without troubling ourselves any more than we wish to with the technical content. While we have seen that the poem does not give much of an idea of what it is like to be an astrologer, it certainly gives us a chance to savour the complexity and variety of astrological theory.

However, there is much to suggest that the poem's didactic ambitions are rather loftier than those of a coffee-table book. Leaving aside the findings of the previous chapters, the

2 Volk 2009, 181f, 262, drawing on Dalzell 1996, 110-112.

Manilius on the nature of the universe

poet's own statements of purpose are very telling. Having described the last and greatest discoveries of human reason, Manilius announces this as his theme (*hoc mihi surgit opus*, 1.113). These discoveries, which must be the referents of *hoc*, do indeed turn out to be the main lessons of his poem:

attribuitque suas formas, sua nomina signis,
quasque vicas agerent certa sub sorte notavit,
omniaque ad numen mundi faciemque moveri,
sideribus vario mutantibus ordine fata. (1.109-112)

'[Reason] determined the shapes and names of the signs, and discovered what cycles they experienced according to fixed law, and that all things moved to the will and disposition of heaven, as the constellations by their varied array assign different destinies.' (tr. Goold)

He will teach us the names and shapes of the constellations, that they move in fixed cycles, that heaven is the determiner of *all* earthly events, and that it is the configurations of the heavens that account for the differences in individuals' destinies. What he does not promise to teach us is how to predict those destinies in advance. The prologue to Book 2 completes the syllabus outline, announcing that it will include the nature and role of the divine:

namque canam tacita naturae mente potentem
infusumque deum caelo terrisque fretoque
ingentem aequali moderantem foedere molem,
totumque alterno consensus vivere mundum
et rationis agi motu (2.60-64)

'For I shall sing of God, silent-minded monarch of nature, who, permeating sky and land and

5.1. *What the Astronomica promises its reader*

sea, controls with uniform compact the mighty structure; how the entire universe is alive in the mutual concord of its elements and is driven by the pulse of reason.’ (tr. Goold)

What Manilius promises us, in short, is to convince us of his view of how the universe works – how it is governed in its entirety by divine reason, how this reason is manifested in and exercised by the heavens, and how every part of the universe has a clearly identifiable role.

As the following survey reveals, these promises are fulfilled in a meaningful way in the *Astronomica* as we have it: we are presented with a clear and thoroughly developed model of the universe, one according to which it is possible for man to discover the future by means of astrology. That Manilius sometimes envisages his readers as inspired to pursue the practical side of the discipline is hardly surprising when he has dangled such an alluring prospect before them – even if his poem alone can do no more than whet their appetites.³

3 It is also possible to read 2.448-452 as implying that the reader will only gain an understanding of the methods of astrology (the *vias artis*) after they have finished reading the poem, achieving their understanding by taking a mental journey through the heavens (i.e. reflecting on the various elements of the discipline).

5.2. A survey of the *Astronomica*'s technical lessons

The aim of the following survey is to identify a rationale behind the choice and ordering of the poem's mass of technical material. It is purposely brief, focusing on the many passages of less than evident relevance to the poem's professed aims. It observes Manilius' teaching technique only from a macroscopic level: closer examination of his didactic techniques, and of passages of an explicitly natural-philosophical character, is saved for the commentary. As a poem whose purpose is to present and argue for a model of the universe, the *Astronomica* contains a great deal of information of more obvious relevance to practical astrologers than to readers seeking a general understanding of how the universe works. The following overview shows that Manilius has a good reason for including the various technical topics that take up the bulk of his work, and that they offer support for his principal claims concerning the universe.

Book 1

Manilius lays much of the groundwork for his natural philosophy in his first book. The prologue's history of civilisation (25-112) touches upon the details of his world-view that proof it against Cicero's sceptical attacks (see Chapter 2). The long cosmological lesson that follows (118-254) then offers a more thorough expression of the central claims on which the possibility of astrology depends (see comm. on 1.122-252):

- (1) Celestial motion is regular and therefore predictable.
- (2) The earth is at the very centre of the universe.

5.2. A survey of the *Astronomica's* technical lessons

(3) The universe and the earth within it are round.

(4) All parts of the universe are interconnected and governed by a divine spirit.

The tour of the constellations (255-455) demonstrates the intricate arrangement of the heavens and the perfect balance of forces that maintains their stability, and offers an evidence basis for the argument from design that comes next (465-531), that universe is created and governed by reason. The lesson on the dimensions of the universe (539-560) offers Manilius not just his first opportunity to show off his gift for 'sums in verse', but the chance to demonstrate the powers of reason over mere observation, 'reason that no barriers or huge masses or dark recesses withstand' (541f.). The description of the celestial circles (561-804) continues the imitation and emulation of his Aratean models, but also houses the long explanation of the Milky Way as the final resting place of virtuous souls: see comm. on 1.758-804.

Most surprising, perhaps, is the inclusion of a passage on comets and shooting stars (809-926): though significant in themselves as omens, they do not play a part in the kind of horoscopic astrology Manilius aligns himself with elsewhere. He justifies the inclusion, however, by pointing out the need 'to fill in the portrait of heaven, and note whatever throughout the whole organism shines strongly at any place or time' (1.811f.):

implenda est mundi facies, corpusque per omne
quiquid ubique nitens vigeat quandoque notandum est

Manilius wants to give a complete portrait of the universe, not just for aesthetic reasons, but as part of a grand argument that everything in the universe has an identifiable reason

Manilius on the nature of the universe

and a function, a view first voiced explicitly at 2.235. For Manilius, moreover, man's reason has allowed him to comprehend and explain everything (1.96-98): if the reader is to believe this, Manilius must offer some explanation of everything that happens in the heavens, the part of the universe where the divine reason is concentrated (1.37). Though other astrologers may not have placed much emphasis on comets, and certainly not on shooting stars, Manilius has pre-empted the possible accusation of inconsistency in assigning predictive power to only some celestial phenomena.

Book 2

We have seen that Manilius prefaces the technical material of his second book with a promise to sing of the divine spirit that unites and governs the world (2.60-66). He reminds us that God has placed control of each man's destiny in the signs (82-86) and that heaven compels us to recognise the fact (105-136). It is in the spirit of these programmatic remarks, surely, that we should approach what follows, an explanation of the signs of the zodiac, their natures, interrelations and subdivisions. For the statements that make up this exposition can be seen as a proof that the zodiac is a product of rational design and exerts its influence according to clear and sensible principles which man, blessed with reason, can recognise and comprehend (a vital part of Manilius' theology: see Chapter 1.6).

Though the technical detail of Book 2 is paralleled in many surviving handbooks, its exposition is entirely unique among the surviving ancient astrological writings: whereas

5.2. A survey of the *Astronomica's* technical lessons

other texts would merely state the material as fact, Manilius makes an effort to show that there is a rationale behind every detail in the universe's design. Some of the rationales serve to explain away apparently arbitrary features of the system: for instance, preempting our asking why Virgo is classed as a double sign (along with Gemini, Pisces, Sagittarius the centaur and the fish-goat Capricorn), Manilius explains that half of her sign belongs to summer and half to autumn (2.176f.). Many of the rationales, however, take the form of what I shall call a reciprocal explanation, whereby the ways in which the signs and their parts relate to each other are shown to make sense through reference to analogous relationships on earth. These, in turn, are seen to have their causal origins in their heavenly analogues. For example, Manilius offers the following explanation of why there are more connections of hostility than friendship among the signs:

scilicet, in multis quoniam discordia signis
corpora nascuntur, pax est sublata per orbem,
et fidei rarum foedus paucisque tributum,
utque sibi caelum sic tellus dissidet ipsa
atque hominum gentes inimica sorte feruntur. (2.603-607)

'Truly, since many are the signs in which men are born for discord, peace is banished throughout the world, and the band of loyalty is rare and granted to few; and just as is heaven, so too is earth at war with itself, and the nations of mankind are subject to a destiny of strife.'
(tr. Goold)

Cumulatively, the parallel relationships offer a proof of several pillars of Manilius' natural philosophy: the interconnectedness of heaven and earth, the rational design behind the universe, and man's ability, through the divine gift of reason, to recognise the principles

behind that design. The reciprocity of the explanations means they also serve as a proof that everything on earth happens in accordance with the heavens' configuration (1.111): for as a set, the *Astronomica's* reciprocal explanations offer a heavenly explanation for a vast number (if not all) of earthly phenomena. For Manilius, the neatness and economy of the zodiac also offer another proof of its rational design, as a purpose can be found for every part of it:

nec quicquam rationis eget frustrave creatum (2.235)

'There is not a thing that lacks reason or has been created in vain.'

When told of the system's elegance and perfection, the reader is reminded of Book 1's argument from design and may reflect that the zodiac offers yet more evidence in support of that claim.

Note, finally, that there is no reason to see any self-contradiction in the use of reciprocal explanation: the causal arrow only points from heaven to earth; and obvious as the artificiality of the beliefs may be to us, there is no trace of such an awareness in the *Astronomica's* narrator.

This insistence on giving rationales, whose uniqueness has escaped the notice of earlier scholars, is vital to Book 2's success as a proof of the rational and recognisable principles behind the zodiac. The picture that emerges is of a neat and elegant system in which everything has its reason and purpose, from the shape and identity of each of the signs to their arrangement in the sequence. The result, too, is another argument from design: for how else could such a perfect system have come about?

5.2. A survey of the *Astronomica*'s technical lessons

The manner in which this material serves as a proof is strongly reminiscent of Lucretius, much of whose teaching similarly consists of the amassing of arguments in support of a physical claim. The role of the *DRN* as a model for the *Astronomica* should steer the reader towards receiving the technical material of Book 2 in exactly this way: that is, not as a first step on the path to astrological practice, but as part of a grand argument.

The final 200-odd lines of Book 2 depart sharply from the subject matter and deserve special attention here. A passing reference to the modifying influences of the planets (2.747f.) triggers a justification of his plan to teach just the bare elements of his subject first, leaving aside how they work in combination (*ratione remota*, 785) for later. The opening words of this justification are especially telling:

undique miscenda est ratio per quam omnia constant.
verum haec posterius proprio cuncta ordine reddam;
nunc satis est docuisse suos ignota per usus,
ut, cum perceptis steterit fiducia membris,
sic totum corpus facili ratione notetur
et bene de summa veniat post singula carmen. (2.749-754)

'From all quarters must be pieced together the design by which all things are ordered. However, all this in due order shall I explain hereafter; now it is enough to teach new principles by demonstrating their uses, so that, when you have acquired confidence in your grasp of the elements, you will be thus able by simple reasoning to mark the complete pattern, and my poem can fittingly pass on from details and deal with the whole.' (tr. Goold)

The promise to teach us how effects combine, which remains unfulfilled at the end of the poem, will be discussed in Section 3 of this chapter. Of no less importance here is his

approbation of teaching unknown things through their applications (*per suos...usus*, 751): that is, he is keen to communicate what practical uses astrologers can put the individual pieces of information to, even if he is not yet willing to share the procedure of combination. The emphasis on application here is striking and may go some way towards explaining why his teaching so often relates to practice, not just the underlying theory: for he seems to regard it as the simplest means of approaching an understanding of the system as a whole (752-754). Moreover, it is surely part of his mission to show that astrological prediction is not just theoretically possible but that humans have arrived at a method for performing it.

Manilius concludes Book 2 with a discussion of the fixed circle of the observer, which is made up of the four cardinal points (788-840) and the four intervening spaces (841-967), which he divides further into twelve ‘temples’. The points, spaces and temples are each said to superintend a specific aspect of human life, and as before a rationale is given for each allocation. Although, in its provision of rationales, the passage serves to further Manilius’ argument for a rational and elegant system, its inclusion at this point in the poem is not easy to explain, first because of its lack of cohesion with the rest of the book’s contents, and second because of its inconsistency with the parallel system of dividing up the fixed circle that Manilius offers in the first part of Book 3. On the latter point, I suspect that Manilius has himself not taken care to check whether endorsing the two systems yields any contradictions, and has embraced both in order to make his astrological system as complex and intricate as possible – a means of proofing himself against Cicero’s attack **C1** (see Chapter 2.2).⁴ We shall encounter more such overlaps and

4 Manilius endorses two contradictory systems again in Books 4 and 5 (4.502-84, 532-709), presumably

5.2. A survey of the *Astronomica's* technical lessons

inconsistencies in the technical material as the poem progresses, and discuss the likely reason for their presence in Manilius' system below (Sections 5.3 and 5.6).

By including this material in Book 2, Manilius also brings to our attention that all the features he has attributed to the zodiac only have any meaning when seen in the context of the fixed circle. He may not be willing to spell out for us yet how the elements of his system work in combination, but is happy to bring to our attention how necessary that combination is if we are to derive any meaning from our observations. We may also observe a pattern behind Manilius' endings of books, which in all five cases involve a marked departure in subject matter.⁵

Book 3

Through an amassing of evidence similar to that of its predecessor, Book 3 advances two important arguments in defence of astrology:

- (i) that the heavens are responsible for all aspects of human life, and that this information can be attained by us in a systematic way;
- (ii) that astrology can be successful so long one takes the utmost precision in the reckoning of time and place at the moment of birth.

The former claim, which Manilius first asserts in the prologue of Book 1, is supported in Book 3 through explanation of the numerous means of dividing the fixed circle, with each part of the system governing a specific area of human experience: from one's social

for the same reason.

5 On books 3-5, see below. Book 1 fits the pattern by closing with a discussion of temporary rather than permanent celestial phenomena (comets and shooting stars) – the first, moreover, for which he has explicitly stated the predictive powers.

standing to the length of one's life, everything is taken into account in the arrangement of the fixed circle. Again, Manilius' treatment of the subject is unique in providing rationales for the various details of the theory: this is no less important than in Book 2, as it reveals a well ordered and reason-based system at work. It is not just another piece in Manilius' grand argument from design, but also further evidence that there are recognisable principles behind the workings of fate that we can learn to recognise, and thereby perform astrological predictions of our own.

The central part of Book 3 (203-509), on finding the precise degree of the ecliptic rising at the moment of birth (called the horoscope), is the vehicle for the second argument. As we saw in Chapter 2, the passage's emphasis on the careful observation of the place of birth (a vital part of finding the horoscope) serves as Manilius' main defence against Cicero's argument **C4**, (pp. 62f.) which accuses astrologers of ignoring the location of the native. More generally, by stressing the importance of precision, accuracy and correct method, the passage pre-empts any accusation against astrologers of being unable to pin down the arrangement of the heavens at the moment of nativity with any exactitude.

Manilius' lesson on the subject is fatally flawed,⁶ and the reader is left with only an inadequate method for finding the most crucial detail of the birth chart, which, if false, causes the entire enterprise to fail (3.207f.). Of the two methods he describes – in considerable and arithmetically precise detail – Manilius rightly recognises the one as faulty, but seems not to notice that the second is essentially the same. We are therefore

6 Manilius draws our attention to this feat matter in the book's prologue, remarking on the difficulty of presenting calculations and technical terminology in verse (3.31-42).

*5.2. A survey of the *Astronomica's* technical lessons*

faced with the puzzle of a mass of precise detail undermined by a relatively basic error. Manilius, it seems, is more concerned with the rhetorical effect of thrusting so much precise reckoning upon the reader, and takes care to give the impression of being discerning in his choice of method for making so important a calculation. For his error is one that only reveals itself with careful scrutiny, and Manilius, if he is aware of the error at all, may be banking on his reader taking the information on trust. So long as we are too busy marvelling at his masterly versification of such challenging material to stop and put his method to the test, the passage will serve its purpose.

As with the other books, Manilius closes Book 3 with a less directly related, and in this case refreshingly accessible, lesson. Lines 618-682 lead us through the four tropic signs (those which mark the beginning of the four seasons), and offer a vignette of each season in turn. Aside from the colour and respite it offers from the technical material, the passage may serve no greater purpose than to ensure that a complete description of the heavens is given to the reader.

Book 4

Book 4 returns from the fixed circle to the zodiac, and in detailing various further subdivisions of it, with a generous peppering of rationales, reveals yet greater intricacy behind the workings of fate, all of which belong to a recognisable and rationally organised system. The book has more to offer, however, to our understanding of the way the world works, for the analogies it offers as rationales shed light on a number of unexplained

earthly phenomena.

The book's first lesson teaches the general influence of the birth sign on the native's character (4.122-293). Hitherto, we have learned only of how the native's prospects in life, and Manilius now begins his explanation of how the other side of human destiny is shaped. We shall discover soon enough that the broad-brush character portraits offered here are not all that astrology can tell us about the native's character, as the further subdivision of the zodiac into decans (4.294-407), the influences of specific degrees of the signs (502-584) and those of the *paranatellonta* (5.32-709: see below) embellish the picture further and account for the full range of human personalities. And as Manilius takes care to point out in his discussion of the decans, these further subdivisions explain how people of very different natures can be born under a single sign (373-386).

Next (408-501) Manilius runs through a set of zodiacal degrees that exercise an especially harmful influence, though he does not explain under what circumstances these degrees come into effect, or on what. The showy versification here may be enough to explain the passage's inclusion, but the subject also offers a chance for heaven and earth to explain each other. Just as we saw the whole range of human interactions mirrored in those between the signs (2.150-269), Manilius now draws an analogy between the different influences of specific, often neighbouring degrees of the zodiac and the way in which natural landscape can vary dramatically across even a limited distance, such as when barren soil appears among fertile fields. In our discussion of Book 2 it seemed reasonable to see heavenly relationships, through the principle of sympathy, as cause and explanation of earthly relationships, rather than merely an analogy. Here, too, it is

5.2. A survey of the *Astronomica's* technical lessons

tempting to see variety in landscape as a direct product of contrasting degrees of the signs.

The explanation of which signs hold sway over which parts of the world (4.744-817) offers an explanation of the differences of attitude and appearance between peoples, as well as their ever-changing hostilities and alliances, which match those of the signs. Cicero had taken astrologers to task for not offering an explanation of regional differences (argument C8 – see pp. 66f.). This passage on the geographical associations of the signs is Manilius' answer to that challenge.

The book's final technical subject is the detrimental effect of lunar eclipse on the sign in which the Moon is stationed at the time of eclipse (818-865). Again, Manilius explains the phenomenon through analogy with earthly ones, from which he derives a general principle (821-827):

scilicet immenso nihil est aequale sub aevo
perpetuosque tenet flores unumque tenorem,
mutantur sed cuncta die variantque per annos;
et fecunda suis absistunt frugibus arva
continuosque negant partus effeta creando,
rursus quae fuerant steriles ad semina terrae
post nova sufficient nullo mandante tributa.

'Assuredly, nothing remains constant through the vastness of eternity, keeping its prime for ever and holding a single course, but all things change with the passage of time and vary over the years. Fertile fields withhold their crops and refuse to supply a continuous yield, exhausted by production; again, lands which had given no return for seed sown furnish unexpected tribute afterwards, and that unbidden.' (tr. Goold)

After offering two further earthly analogies (earthquake and flood) and one mythological

Manilius on the nature of the universe

(Phaethon's burning of the sky with the chariot of the sun), Manilius concludes his explanation with another general principle (838-840):

in tantum longo mutantur tempore cuncta
atque iterum in semet redeunt. sic tempore certo
signa quoque amittunt vires sumuntque receptas.

'All things undergo such changes over long periods and then return to their normal states again. Even thus at a certain time the signs too lose their powers and on recovering them exert them anew.' (tr. Goold)

The conscientious student will be disconcerted by the first passage's claim that all things are subject to change: for it had been a vital part of Manilius' world view that the stars are changeless. This second passage clarifies the issue, showing that the changes are only temporary, and so no cause for alarm. All things, we are reassured, return to their former state.⁷ The passage on ecliptic signs thus offers a reciprocal explanation of earthly phenomena that may otherwise have proved a stumbling block to readers new to the idea of a rationally directed universe in which disasters nonetheless happen.

Book 5

By the end of his fourth book, Manilius has little left of the cosmic picture to fill in: he has shown how astrology can account for the vast range of human characters and destinies, shown that there is a purpose and rationale behind all the workings of the zodiac and fixed

⁷ This detail reveals the lack of truth behind Manilius' retelling of the Phaethon myth as an explanation for the Milky Way (1.736-49).

5.2. A survey of the *Astronomica's* technical lessons

circle, and accounted for many earthly phenomena that may otherwise have seemed inconsistent with the idea of a divinely governed universe. We have seen that almost everything in the celestial sphere has a clearly identifiable function within his system, with an elegance and economy that could only be the product of rational design: even the Milky Way, comets and shooting stars have their roles. All that now remains is for Manilius to talk us through the purpose of those constellations that lie outside the zodiac, whom he had introduced us to in Book 1 but whose role in the system he has not yet explained. This is the purpose of Book 5, as its proem announces: some would end their tour of the signs here, and round off their journey with a final descent through the planets (5.1-6). Not so Manilius, whom the universe orders instead to revisit the non-zodiacal stars, which he has so far discussed only once (5.7-11). That first listing had said nothing of their influences on the native, a topic that takes up almost all of Book 5. In Manilius' astrological system, the extrazodiacal signs rising simultaneously with the degrees of the zodiac under which we are born (from where they gain the Greek name *paranatellonta* or 'simultaneous risers') play a part in deciding upon our careers. For instance, those born under Delphinus the dolphin will make excellent swimmers and seamen, or share the animal's talent for acrobatics (5.416-448). Again, Manilius takes care to explain the link between the identity of the *paranatellonta* and the effects they have, with their shapes serving as indicators and mnemonics for mortals to use in their astrological predictions. Having had to settle for the fictitious catasterism myths as explanations for the signs' appearances, we are at last given the true rationale.

The extreme simplicity of this means of assigning careers is surprising given the degree of

intricacy elsewhere in Manilius' system. The best explanation, perhaps, is that Manilius' only concern here is to assign a function to these as yet jobless constellations, and to enjoy the opportunity the material offers to craft lively and engaging vignettes for each career.

As with his other four books, Manilius ends his fifth with a short lesson on a separate, though not wholly unrelated, topic: the reader had perhaps wondered why the stars that make up the heavens differ in their brightness, with a great number being so dull as to be nameless. Manilius may have explained the function of the more noteworthy extrazodiacal stars, but what of the countless stars of the lowest magnitude? The answer, on which the poem ends, takes the form of another analogy: just as in great cities (such as Rome) the citizens are divided into classes, with influence limited to those at the top, so too are the stars split into classes, the largest of which is the lowest (734-742). The community of stars, therefore, offers a reciprocal explanation of the structure of human society, of which it is the model and cause. As in human society, the stability of the heavens depends on a fine balance of power: had nature given the lowest class of stars powers to match its number, the sky would not be able to bear it and the entire universe would burn (743-745).

At the close of the *Astronomica*, a *raison d'être* has been offered for every constituent part of the universe. We are reminded of Manilius' claim that 'there is no thing that is lacking a reason or has been created in vain' (2.235) and have seen that in his system this is true. The *Astronomica* as a whole, then, constitutes the strongest possible argument from design: for how else could such a universe, which down to the finest detail *makes sense*, have come to be?

5.2. A survey of the *Astronomica's* technical lessons

Manilius, we have seen, allows a startling number of inconsistencies into his technical astrological teachings, which may escape the notice of any reader not taking notes, but which make his method entirely inapplicable in practice. Although Manilius has at times addressed his readers as if assuming they hope to become practitioners of astrology, there is overwhelming evidence supporting this view that Manilius did not envisage us using his work as even a beginner's textbook for practical astrology: he omits crucial details of the most rudimentary kind and allows himself to make careless errors. Readers may not notice these shortcomings (those concerned with technical detail are surely likelier to turn to a prose manual than a didactic poem), but it is hard to believe that they are products of incompetence rather than just carelessness. In striking contrast, we found in Chapter 1 that his natural-philosophical teaching is entirely free of contradictions, and is clearly the product of a painstaking synthesis. In short, Manilius is only careless where he can afford to be. What is more, the great pains to which Manilius goes in providing rationales – something that sets him apart from the rest of the surviving astrological tradition – has given us cause to believe that the *Astronomica's* true purpose must be the communication of its natural-philosophical world-view, to show that his version of astrology can offer a comprehensive account of the nature of the universe. As it stands, Manilius' poem achieves that goal quite spectacularly.

5.3. Unfulfilled promises

Neat as this explanation may be of the poem's contents, it still leaves us to wrangle with the problem of the unfulfilled promises to explain (i) the role of the planets and (ii) how the various elements of the system combine. Even if such teachings are not necessary for Manilius' greater purpose, we are left wondering why he makes the promises at all. In what follows, I shall review the evidence, consider the most influential explanations for these missing lessons and advance a new alternative.

Given the confused transmission of the *Astronomica* and the presence of at least one obvious lacuna, it is tempting to suggest that treatments of the planets and of *mixtura*, the manner in which the elements of astrology are combined (3.587), did once form part of the poem but have been lost. However, an adequate discussion of the latter issue would take up so many lines that we would have to assume that an entire book, at the very least, is missing. If Manilius stuck to his plan of teaching elements first, this treatment would need to come, at the earliest, after the lesson on *paranatellonta* (5.32-709). However, the proem to Book 5 strongly suggests that it is the poem's final book, making it most likely that Manilius never kept his promise to teach us the workings of *mixtura* – at least not in the present work.

At 2.959-965, Manilius promises to discuss the way in which the planets modify the influences of the temples in the part of his work dedicated to the planets (2.965 *haec mihi sub certa stellarum parte canentur*). In other words, the part devoted to the planets will also deal with *mixtura* – a topic which we have just seen as unlikely to have made it

5.3. Unfulfilled promises

into the *Astronomica*. In abandoning his plans to discuss *mixtura*, Manilius may have given up on the planets too.

But at what point does he decide to give up on his plan to address these two topics?

The final unambiguous promise to discuss them is as early as 3.155-158:

quarum [*sc.* stellarum] ego posterius vires in utrumque valentis
ordine sub certo reddam, cum pandere earum
incipiam effectus.

‘Of the force they (the planets) exert for good or ill I shall later tell in due order, when I come to rehearse their influences.’ (tr. Goold)

Towards the close of Book 3 comes another apparent statement of intent, though it is rather more non-committal. Manilius observes that the length of the native’s life, as determined by the divisions of the fixed circle, is further affected by the position of the planets;

sed mihi templorum tantum nunc iura canentur;
mox veniet mixtura suis cum viribus omnis,
cum bene materies steterit percognita rerum
non interpositis turbatarum undique membris.

‘But I now shall sing only of the ordinances of the temples; later the whole complex design will appear with its full force, when the constituent parts of the universe are firmly grasped and not made confusing with portions scattered everywhere.’ (3.586-589, tr. Goold)

This contrasts strikingly with earlier such statements in its ambiguity: is Manilius still expressing intent to discuss the principle of *mixtura* himself, or will it make itself apparent

to the reader once he has grasped each of the elements separately? The change in tone may be the first sign of a change of plan on the narrator's part. At any rate, the next we hear of the planets is a puzzlingly specific detail concerning their powers of heating and cooling, offered as an explanation for why certain degrees of the zodiac are to be avoided (4.498-501):

hae partes sterilem ducunt et frigore et igni
aera vel sicco vel quod superaverit umor,
si rapidus Mavors ignes iaculatur in illum
Saturnusve suam glaciem Phoebusve calores.

'These degrees are allotted an atmosphere made sterile by reason of cold and fire or because of drought or superabundant moisture, be it scorching Mars who launches his flames upon it or Saturn his native ice or Phoebus his heat.' (tr. Goold)

Nowhere else does Manilius go into so much detail on the powers of specific planets, mentioning only that they can have a good or bad influence. While what he speaks of here is not *mixtura* but the mechanics of planetary influence, the detail still seems very much at odds with the method he has so often defended of teaching the elements of astrology in turn. All previous references to the planets' influences had been followed soon after by a reiteration of the promise to discuss them properly in turn, but no such promise follows these remarks. Only two explanations seem credible: that by this point Manilius has already abandoned his plans to discuss planetary influence, or that he has already done so in a passage now lost, having chosen to treat them separately from *mixtura* after all. If the latter is the case, the passage must have come between 3.158 (the last clear promise to discuss planets) and 4.498. At no point between 3.158 and the end of Book 3 is there a

5.3. *Unfulfilled promises*

break in the sense where the passage could have been; and so it would need to have been at the end of the book. Given Manilius' preference for ending books with a change of subject, and the comparative brevity of Book 3 as we have it, this looks appealing. In a passage of up to three hundred lines, Manilius could have communicated a great deal of general information about the influences of each of the seven planets, as well as something on the mechanics of those influences. This possibility, which has not been raised by earlier scholarship, is in my view the only credible scenario in which the *Astronomica* ever contained a passage on the planets.

However, there is good reason to believe that Manilius never dealt with the planets at all. As has long been noted, there are various parts of his system where he seems to have deliberately reduced the involvement of the planets, giving the roles they would have played in conventional astrology to the zodiac instead. Where this happens in passages that would have preceded the lesson on planets (such as the treatment of dodecatemories at 2.693-737), this behaviour is reasonable enough: Manilius, in keeping with his avowed method, would not want to discuss the finer aspects of planetary theory before their appointed slot. That he does the same in his treatment of the decans in Book 4 (294-386) is harder to explain if he had dealt with the planets at the end of Book 3 – the only imaginable place for such a passage.

At some point during Book 3, then, Manilius – or at least his narrator – abandons his plans to cover the planets, as well as *mixtura*. There are practical reasons for omitting the latter topic (its magnitude, in particular); but, as we have seen, Manilius need not have discussed the planets at great length to discharge his duty. Why, then, did he neglect to

include the material?

In Katharina Volk's eyes, Manilius has tried to sideline the planets from his system as much as possible, seeing them as a source of embarrassment: for in their complex, 'wandering' movements, the planets threaten to undermine his portrait of a regular and well-ordered cosmos.⁸ In making passing references to planetary influences, Manilius shows he is aware of their importance in astrology, but does not want his readers to dwell any more than is necessary on their wandering nature and thereby lose faith in his claim that celestial motion is regular.

Volk's view provokes a number of objections. First, the attitude we find elsewhere in the sources is that planetary movement was both understood and predictable.⁹ Even if the movements had not been distilled into lawlike mathematical statements, the regularity of the movement at least was recognised. Indeed, astrologers could avail themselves of published tables stating the positions of the planets on days in the future: one did not need to calculate or observe the positions oneself to practise astrology.¹⁰ There was no need, therefore, for Manilius to fear any embarrassment from the planets, which he must have known moved no less regularly than the rest of his heavens. Moreover, if he did see the planets' apparently wandering movements as a threat, it is surprising that he repeatedly describes them as *vagus* ('wandering'), including at the end of the poem (5.722).

8 Volk 2009, 116-126.

9 Cic. *ND* 2.51: *maxime vero sunt admirabiles motus earum quinque stellarum quae falso vocantur errantes: nihil enim errat quod in omni aeternitate conservat progressus et regressus reliquosque motus constantis et ratos.*

10 The positions of all the relevant heavenly bodies on any given day could be found in so-called sign-entry almanacs, on which see Jones 1999, 176 and 301-307.

5.3. *Unfulfilled promises*

A second explanation, offered by Steven Green,¹¹ is that Manilius has deliberately withheld the information on planets and *mixtura*, to keep such politically sensitive information out of the public's hands. His interpretation hinges on reading the text as a dialogue between the narrator as teacher-figure and the student addressee. At two points, the narrator gives voice to objections, one from the student, one from an imagined 'someone', that the scheme of fate is too intricate to comprehend.

'multum' inquis 'tenuemque iubes me ferre laborem,
rursus et in magna mergis caligine mentem,
cernere cum facili lucem ratione viderer.' (4.387-389)

'But,' you say, 'the task you bid me undertake is great and subtle, and you are plunging my mind back into deep darkness just when I thought a simple principle was enabling me to see light.' (tr. Goold)

sed quid tam tenui prodest ratione nitentem
scrutari mundum, si mens sua cuique repugnant
spemque timor tollit prohibetque a limine caeli?
'conditur en' inquit 'vasto natura recess
mortalisque fugit visus et pectora nostra,
nec prodesse potest quod fatis cuncta reguntur,
cum fatum nulla possit ratione videri.' (4.866-872)

'But what avail is it to search out the secrets of the shining firmament with such subtle reasoning, if a man's spirit resists and fear banishes confidence and bars access to the gate of heaven? 'See,' he objects, 'nature is buried in deep concealment and lies beyond our mortal gaze and ken; it cannot profit us that all is governed by fate, since the rule of fate cannot by any means be seen.' (tr. Goold)

11 Green 2014, *passim*, building on Green 2011.

Manilius on the nature of the universe

Following the second objection, the teacher abandons his plans to discuss the planets and *mixtura*, recognising that the level of complexity they bring will be too much for the student to bear. In having his teacher-figure sabotage the project, Manilius succeeds in entertaining us with the politically risky offer of an astrological education, but without letting the closely held secrets of the discipline fall into the wrong hands.

This view, as formulated by Green, has its obstacles. First, the manner in which the *Astronomica*'s narrator engages with the addressee elsewhere makes it difficult to conceive of the work as a spoken conversation. Even in the fictional framework that the poem creates, the narrator is addressing a *reader*, not a listener: this is emphasised not just by the use of *legentem* (3.158) to denote the student, but also by the narrator's referring the student to earlier passages, almost as if he conceives of the poem as a reference work. The 'outbursts' cited above are, therefore, entirely the product of the narrator's imagination, not the words of the student. What is more, it is difficult to see the second as an 'outburst' at all – not because it is put in the mouth of a hypothetical complainer rather than the reader's, but because there is no reason why the reader, so recently reminded of the need to put in hard work to succeed in astrology (4.866-8), should sympathise with the complainer at all. Its true purpose seems, rather, to be to usher in the reflections on the relationship between mankind and God with which the book closes (873-935).

These points, however, do not fully discredit Green's reading. Manilius could nonetheless have created a fiction in which the narrator-figure comes to realise too late that his proposed project is too ambitious. The likely point for the change of heart is not the second 'outburst' but the first, with 3.586-489 as the first trace of waning confidence

5.3. *Unfulfilled promises*

(see p. 155 above). In that first outburst the narrator, clearly putting himself in the student's shoes, achieves some recognition of the difficulty of grappling with the various subdivisions of the fixed circle, let alone the added complexity that the planets and *mixtura* would bring.

Even so, the political dimension of Green's reading faces a further challenge. Since Manilius' astrological teachings in Books 2 and 3 already feature so many crucial omissions and errors which, we have established, cannot all just be oversights, there seems no need for him to engineer this fiction of the teacher giving up on his mission: Manilian astrology, as a practical discipline, is already doomed to failure. While again this observation is hardly a fatal blow to Green's reading, I believe a still better explanation of the omissions can be offered.

As we have seen, the *Astronomica* as it stands achieves its didactic goals admirably. There is simply no need for Manilius to say any more on the planets than he already has: we are aware of their importance in his system and need only know that they have clearly definable functions. Since there is no didactic need for Manilius to promise us teaching on the planets and *mixtura*, the reason must be literary. Manilius, as a devoted imitator of Lucretius, cannot have helped but pick up on an unfulfilled promise in that poet's work.

In each poem, the unfulfilled promise has the desirable effect of showing the reader that there is an answer to a pressing question (in Lucretius' case, 'What is the true nature of the gods?' and in Manilius', 'How do the planets fit into the picture?') while saving the

narrator the effort of giving the answer in full. It is perhaps partly in a tongue-in-cheek imitation of Lucretius that Manilius, too, has chosen not to honour his promise.

Germanicus, another of Manilius' major points of contact in the didactic tradition, offers a further model. In his version of the *Phaenomena*, he gives a more optimistic turn on Aratus' refusal to deal with the courses of the planets (Arat. 460-461):

hoc opus arcanis an credam postmodo Musis,
tempus et ipse labor, patiantur fata, docebit (Germ. 445f.)

'Time, and the amount of effort involved, will show whether, fate permitting, I can afterwards direct this work into those erudite studies' (tr. Gain 1976).

We do not know whether Germanicus realised this hope.¹² However, what is important here is the escalation from Aratus' original *recusatio*: instead of claiming to lack the requisite courage, as his model does (οὐδ' ἔτι θαρσαλέος κείνων, 460f.), Germanicus shows more self-confidence and ambition. It is in a spirit of *aemulatio*, I believe, that Manilius continues this escalation, going so far as to promise with absolute confidence that he can and will deal with the planets, showing his superiority over his predecessors in the astronomical didactic tradition.

For these reasons, I believe that Manilius' unfulfilled promises are best explained not as a means of sabotaging his teaching, or of avoiding embarrassment, but as part of a literary game with his astronomical predecessors and his principal model in the

12 We know from surviving fragments that Germanicus dealt with the astrological influences of the planets, if not in his *Aratea* then certainly in another work. However, what he promises here is not simply to discuss the planets but to describe the cycles of their movements (441-444), an especially demanding challenge.

5.3. *Unfulfilled promises*

philosophical didactic tradition.

5.4. What do we learn about the poem's imagined reader and target audience?

Having established what the narrator of the *Astronomica* sets out to teach his addressee, we must ask whom the teaching is directed at – no less important a part of the poem's communicative aim.

While the narrator addresses various figures in the vocative – Caesar, divinities, and constellations – the majority of the narration is directed at a faceless addressee, conceived of as a reader (*legentem*, 3.158) rather than a listener. We learn a great deal about the imagined reader's educational background: the narrator assumes that he knows not just Latin but Greek, and is well versed in the literature of both tongues. On the other hand, the reader's philosophical training is not assumed to extend beyond the grounding in Epicureanism that comes with reading Lucretius. Manilius does not avail himself of readers' familiarity with Stoicism to ease the task of communicating his natural-philosophical message: though he makes the occasional allusion to more advanced Stoic ideas for the benefit of those in the know, he explains in full all that is necessary for understanding his world view.

In contrast, his lessons on the technical detail of astrology – a subject on which he also assumes no prior knowledge – contain no such allusions, suggesting that the poem's target audience excludes more experienced astrologers. The poem's slapdash synthesis of astrological doctrine strengthens this impression, since such a figure would surely be sensitive to its technical shortcomings and so unlikely to take seriously its teachings on

other matters. This is by no means trivial. Since the poem's world-view is manifestly the poet's own work, and so cannot have been widely shared in his day, at least in its precise form, one might expect him to be keen to promote his criticism-proofed model of the universe among established astrologers. Manilius' pedagogical leanings, however, left him with a choice between targeting his work at the astrological community and converting newcomers; writing for both was not an option. For Manilius is clearly committed to the view that the only way to teach beginners a subject is by dealing with its basic elements in turn, and that this should be achieved through showing their practical applications (2.751 *docuisse suos ignota per usus*). Recognising, presumably, that no experienced astrologer was likely to read a work teaching the elements of his discipline, he chose to direct his attention to the neophyte.

5.5. Manilius, Rome and Empire

The *Astronomica* may succeed in painting a well-defined picture of how the universe works, but it leaves us with a far less clear impression of how Rome and her Emperor fit into it. Manilius devotes a significant proportion of his poem to the subject, but addresses it in a vague and ambiguous a manner that contrasts tellingly with his more general teachings on the nature of the universe.

It is no surprise that an astrological author of Manilius' day should give some pride of place to the Emperor. As Green and Volk have shown, both Augustus and Tiberius exercised at least some degree of a hold over the discipline, each relying on its predictions

5.5. *Manilius, Rome and Empire*

as a validation of their rule. Whether or not the sharing of astrological method would actually have landed him in any trouble, it was at least prudent for Manilius to pay them homage. Manilius ends his first proem accordingly with unambiguous praise of the ruling Emperor:

hunc mihi tu, Caesar, patriae princepsque paterque
qui regis augustis parentem legibus orbem
concessumque patri mundum deus ipse mereris,
das animum viresque facis ad tanta canenda. (1.7-10)

‘You, Caesar, First Citizen and Father of your Country, who rule a world obedient to your august laws and merit the heaven granted to your sire, yourself [a] god, are the one who inspires my design and gives me strength for such lofty themes.’ (tr. Goold, with my brackets)

This is no faint praise: Manilius will go on repeatedly to claim that his song is inspired by God/Nature/Reason, confirming that his calling the Emperor ‘[a] god’ here (1.9) is to be taken literally. More striking still are the numerous references to the deification of Augustus and Julius, voicing the contemporary opinion (and official imperial line) that heaven has a place for both Julius and Augustus – and in the latter’s case, one in the zodiac amongst the other divinities, bringing the special privilege of exercising influence over earthly events:

descendit caelo caelumque replevit.
quod reget Augustus socio per signa Tonante
...

Manilius on the nature of the universe

altius aetherii quam candet circulus orbis. (1.799f., 802)¹³

'It (the Julian line) has descended from heaven, and heaven it has replenished. Augustus shall rule it (i.e. heaven) with the Thunderer (Jupiter) as his companion through all the signs, ... being on a loftier level than that on which the band of the aetherial circle (i.e. Milky Way) shines.'

Manilius also awards plenty of glory to the Roman people generally, noting that, for all the souls of virtuous Greeks and barbarians that dwell in the Milky Way (1.762-776), it is Romans who now make up the greatest number (777). Rome's position as world leader, too is divinely engineered. Manilius finds proof of this in the staggering list of events that make up Rome's history (4.23-62), a list that in his eyes could by no means be the work of chance (4.23, 49, 56). Fortune, who so often marks the destinies of men and peoples with unexpected and capricious reversals, has seen fit to allow Rome's rise.

The god-given nature of Rome's success is reasserted in the geographical portion of Book 4. Though all regions have a tutelary sign, Manilius speaks of Rome as if her connection to heaven is a special one:

Italia...quam rerum maxima Roma
imposuit terris caeloque adiungitur ipsa. (4.694f.)

'Italy, which Rome, greatest city in the world, has put in charge of the earth – Rome, who is herself joined to heaven.'

The sign allotted to Italy, too, is shown to be especially apposite, further consolidating the impression that Rome's global standing is part of the universe's grand design:

¹³ See comm. ad loc. on the textual difficulties in this passage.

5.5. *Manilius, Rome and Empire*

quod potius colat Italiam, si seligat, astrum
quam quod cuncta regit, quod rerum pondera novit,
designat summas et iniquum separate aequo,
tempora quo pendent, coeunt quo noxque diesque?
Hesperiam sua Libra tenet, qua condita Roma
orbis et imperium retinet discrimina rerum,
lancibus et positas gentes tollitque premitque,
qua genitus Caesar melius nunc condidit urbem
et propriis frenat pendentem nutibus orbem. (4.769-777)

‘What sign would better have the care of Italy, if Italy could choose, than that which controls all, knows the weights of things, marks totals, and separates the unequal from the equal, the sign in which the seasons are balanced and the hours of night and day match each other? Italy belongs to the Balance [Libra], her rightful sign: beneath it Rome and her sovereignty of the world were founded, Rome, which controls the issue of events, exalting and depressing nations placed in the scales: beneath this sign was born the emperor, who has now effected a better foundation of the city and governs a world which hangs on his command alone.’ (tr. Goold)

It is Rome’s destiny, then, to hold the rest of the world in its scales and decide the fate of other nations. This destiny is confirmed not just by Libra’s role as the sign in charge of Italy:¹⁴ it was also the sign under which the city was founded and under which its current Emperor was born.¹⁵ The implication is that, again, this can be no coincidence, but all part of a divine plan.

So far the evidence considered has redounded to the glory of Rome and her Emperor, and shown astrology to be happily in step with imperial ideology. There is much in the text,

14 Although Manilius may in some cases have taken the liberty of deciding which sign oversees which lands, his allocation of Italy to Libra is paralleled in Dorotheus of Sidon (Goold 1977, xci).

15 Volk 2009, 147.

however, that threatens to muddy the picture. Manilius has promised Augustus immortality not in the Milky Way, with the other great Romans of the past, but in the Zodiac (1.799-803), whence he will continue to exercise an influence upon the world. As we saw in Chapter 1.6, however, this seems at first sight to contradict Manilius' belief that the celestial sphere is unchanging in its appearance (1.521). Unlike Virgil (*G.* 1.33f.), however, Manilius gives no clue as to the form in which Augustus will take up his heavenly residence. Rather than contradicting himself on a crucial point of his world-view, Manilius may envisage the fire that makes up Augustus' soul being added to that of the planets and signs (see comm. on 1.777-804). To spell this out in full would greatly lessen the significance of the praise, and reveal the sleight of hand by which Manilius manages to subscribe to belief in Augustus' deification without compromising his own philosophical position.¹⁶

A second potentially subversive element in Manilius' universal model is the tendency of all things to return after a time to their original state, a point made to explain the temporary effects of eclipses on signs (*cuncta...in semet redeunt*, 4.838f.: see p. 146 above). The implication for events on earth is striking: whatever great upheavals there may be will be reversed eventually including, we must presume, the rise of Rome. Manilius has most likely refrained from offering human analogies in this passage for tact's sake, but the subversive undercurrent is there to be found nonetheless. Readers who notice it will be left to wonder, too, if the celestial forms of the deified Caesars will not also disappear again in time.

¹⁶ Note that the form of the deified Julius needs no special explanation, since for Manilius his home is in the Milky Way.

5.5. *Manilius, Rome and Empire*

Finally, Rome's rise may have been divinely willed, but there is no reason why her destiny should not now go the same way as all the other states whose fortunes were so catastrophically reversed (4.63-66). All events so far may point to continuing Roman success, but Manilius has put us in no doubt that Fortune acts on caprice rather than principle, paying no attention to rank or virtue:

quantum est hoc regnum, quod regibus imperat ipsis!
quin etiam infelix virtus et noxia felix,
et male consultis pretium est, prudentia fallit;
nec Fortuna probat causas, sequiturque merentis,
sed vaga per cunctos nullo discrimine fertur. (4.93-97)

'What wonderful kingship is this, whose bidding even kings obey! Moreover, it happens that virtue fares ill, and guilt fares well; poorly conceived plans are rewarded, whilst foresight fails; nor does Fortune examine the merits of a case and attend the deserving, but moves capriciously through the lives of all without distinction.' (tr. Goold)

In this prologue on Fortune, Manilius exercises great tact when holding recent historical events up to this light. There is no mention of outright disasters for Rome except those soon followed by an even greater Roman success: hence the battle of Lake Trasimene is mentioned (4.39), but not that of the Teutoburg Forest, which Manilius speaks of elsewhere (1.898-903). He discusses the assassination of Julius Caesar, likewise, as a necessary sacrifice for the greater good (4.62 *possent ut vincere fata*). The only great Roman whose reversals of fortune are analysed in any detail is Pompey the Great, whom Manilius clearly feels justified in scorning as the enemy of the divine Julius and Octavian (4.50-55).

Given the challenges of reconciling his world-view with the political correctness of his day, it is no surprise that Manilius is somewhat cagey in his treatment of Rome and her rulers. Whether or not the poem takes an actively subversive stance on these matters, however, we can see considerable tact at work in his selection and placing of information on the subject. Manilius also exercises considerable prudence in his ambiguous references to the Emperors: as Volk's excellent survey has shown, it is likeliest that at least some, if not all, of the *Astronomica* was written under Augustus.¹⁷ However, the lengthy debate on the subject reflects the strategic ambiguity in each of the references. I would suggest that Manilius, wary of letting the death of an Emperor falsify his poem on predicting the future, has deliberately ensured that all references to the Emperor could just as easily denote Tiberius as Augustus.¹⁸

Manilius has managed to walk a very fine line. He pays tactful acknowledgement to the Emperor (the main beneficiary and to an extent the warden of astrological expertise), presents Roman dominion as God-willed, and echoes the prevailing narrative of the deification of Julius and Augustus. Through some slight obfuscation in his treatment of these matters, he achieves this without compromising his natural-philosophical standpoint. It is hard to tell how much of a subversive motive we should read into this sleight of hand, but the possibility of an anti-Imperial undercurrent in the *Astronomica* is certainly one deserving further exploration.

17 Volk 2009, 137-61.

18 The same caution may offer another explanation of his reluctance to specify the nature of the deified Augustus' heavenly home: had he subscribed, say, to Virgil's view that Augustus will reside between Virgo and Libra (*G.* 1.33f.), the prediction would have immediately been proved false on Augustus' death.

5.5. Manilius, Rome and Empire

5.6. Conclusion

Seeing the *Astronomica* as a lesson on how the universe works, we have avoided the main pitfalls encountered by earlier readings: at the poem's conclusion, Manilius has shared his natural-philosophical perspective with admirable clarity, leaving us with no sense of having received an incomplete account. Wherever Manilius promises but does not deliver teaching turn out not to be crucial to the success of his mission, while their omissions can be explained as a form of imitation and emulation of his models. That Manilius is so tolerant of inconsistencies and overlaps in the technical material of his poem, and yet has plainly gone to great pains in constructing and communicating a consistent model of the universe, strengthens the impression that the latter is of greater importance to our poet. We have likewise found the poem's programmatic statements concerning its aims to be wholly consonant with this reading, and, in fact, to encourage it. If Manilius appears at times to be approaching his didactic goal via the by-roads, offering practical instruction instead of uninterrupted pronouncements on the nature of the universe, that too may be the Lucretian influence at work: just as, in the *DRN*, long sets of arguments on points of Epicurean physics serve cumulatively to persuade us against superstition, so in the *Astronomica* the masses of theoretical statements and accompanying rationales serve as a proof that the universe is the work of Reason and that man, possessing a share of that reason, can get to know the intricacies of that fine mechanism.

Chapter 6: An Epilogue

The French symbolist writer Marcel Schwob wrote, among other fictional lives of historical Roman figures, a short biography of Lucretius.¹ In it, Schwob takes full advantage of the *DRN* as 'evidence' for its author's character – not just Epicurean physics but a love of analogy and interest in the mechanisms of sexual attraction – to craft a rich and imaginative picture of 'Lucretius's private and public life. This short epilogue does not share all of Schwob's inventive ambitions, but joins it in asking a question of real importance to the social and intellectual history of the era: what presumptions can we make about the education and career of the *Astronomica*'s author that will explain how that extraordinary text came to be written?

We cannot really be sure of the poet's name or origin, and the problem of his work's date remains unsolved. That he knows Greek as well as Latin is confirmed by his facility in using Greek astrological terms, as well as a bilingual pun on *onus* and ὄνους at 5.350.² Despite his devotion to astrology, he seems too unfamiliar with the details of astrological practice to be an actual practitioner of the art.³ He is, rather, a philosopher, but not one of any formal training: he is an amateur, led to philosophy by a desire to defend his beloved astrology from the attacks of its critics, meticulously piecing together a model of the universe from works of popular philosophy, one specifically tailored to weather the storms of Academic criticism he found in the very same works. His

1 Schwob 1896. An English translation of the life of Lucretius is available in Grealis 2015, 63-65.

2 Goold 1977, 328.

3 I am led to this conclusion not just by the confusions in his teaching of the technical material, but also by his willingness to introduce innovations that clearly have not been put to the test in real astrological calculation: see p. 80 on his innovations at 2.856-967.

An Epilogue

Astronomica was not – and could never have been – meant as the first stage in its readers' astrological training, though it might inspire them to undertake such a training elsewhere. Nor, on the other hand, can its main message be one of the relationship between mankind and the divine, as Volk would have it (Volk 2009, 261f.). The poem's few forays into ethics show too little of the thought and care invested into its natural philosophy for that to be a likely aim. Rather, it is both an apology of and victory ode to the art of astrology itself. The picture of the author that emerges from the present study is of a passionate devotee of astrology who, in developing his own philosophical framework to support it, was in the end more enamoured with his scaffolding than with the edifice itself.⁴

4 Alchemy in the renaissance and early modern period offers a valuable point of comparison for Manilius' place in the astrological tradition: like Manilius, many authors of alchemical texts show a greater interest in the theory and underlying philosophy of their science than in its practice. On the breadth of preoccupations in the alchemical tradition, see Nummedal 2011.

Commentaries

The following three case studies examine, through the lens of lemmatised commentaries, three passages from the first book, the part of the poem in which Manilius concentrates his most important natural-philosophical teachings. Their principal purpose is to observe Manilius' teaching techniques at work 'in real time' – something the preceding chapters could not do – and watch the picture of his universe gradually emerge from his densely allusive verse. However, I have not shied away from remarking on textual matters wherever I feel a valuable contribution can be made to the debates.

118-252: THE FORM AND NATURE OF THE UNIVERSE

Before embarking on a description of the celestial sphere Manilius introduces his student to the rudiments of cosmology. He begins with several opinions on the first beginnings of the universe (122-148), then describes its creation from the four traditional elements (122-171) before giving a series of arguments concerning the position and shape of the earth within it (172-246). In the climax of the passage (247-254), he introduces us to the divine force that rules and unites the various parts of the cosmos.

General cosmological inquiry is alien to the Aratean tradition. For Aratus, it is enough to say that the signs are a gift from a benevolent God; we need no further knowledge of the cosmos and can ignore its underlying mechanics. Manilius, however, prefers a physical justification for his astrology. This part of the book, accordingly, aims to win us round to the four main assumptions on which his astrology depends.

- (1) Celestial motion is regular and therefore predictable.
- (2) The earth is at the very centre of the universe.
- (3) The universe and the earth within it are round.
- (4) All parts of the universe are interconnected and governed by a divine spirit.

All astrology relies on the regularity of celestial motion for its applicability: we may attribute an event on earth to a specific configuration of the heavens, but that information is only useful if we can anticipate the configuration's recurrence. For the same reason, celestial motion must *appear* regular to us on earth, otherwise our observational data cannot be trusted to reflect the true state of the heavenly bodies. If, therefore, Manilius can persuade us that the earth is at the centre of the universe and not moving about within

it, we will know that our perceptions of celestial motion are consistently accurate. Moreover, if we believe in its roundness, we will know that any discrepancy in observational data is caused by difference of position upon the sphere.

Finally, we must believe that events in heaven correspond consistently with those on earth; otherwise, why should we look to the sky for information about our fate? To persuade us of the correspondence, Manilius tells us that a divine spirit rules the cosmos as a single living organism. This orthodox Stoic view (see Salles 2009, 1f.) is the most important of Manilius's four theses and consequently reserved for the passage's conclusion. Throughout the cosmology, however, Manilius tacitly promotes the idea by continuously personifying the universe as a living being. The discussion of creation is full of imagery drawn from the life-cycle of organisms (birth, death, parentage), so that by the time we reach the climax of the cosmology, we are the more ready to view the universe as an interconnected organism.

118-121. Before he can teach his student about the signs and their influence on fate (109-112), Manilius feels he must describe the structure and appearance of the universe as a whole, because (*quoniam*) his song is of the sky (118), and the fates come down from the sky to earth (119).

The programmatic statement introduces and justifies the following cosmological exposition: since Manilius's poem concerns the connection between heavenly and earthly events, he must first describe the wider whole of which heaven and earth are parts, and account for the connection between the two.

118. caelo descendit carmen ab alto : a figurative reworking of Verg. A. 8.423 (*ignipotens*) *caelo descendit ab alto* (borrowed also at 4.817). Again Manilius casts himself as the passive vehicle of heavenly song (see 22-4, 113).

descendit : probably present rather than perfect, in light of *věnit* (119). The heavenly song flows down continuously to the poet, once more recalling the Pythagorean idea of the constant music of the spheres.

119. venit in terras fatorum conditus ordo : sc. *a caelo*. The line reasserts man's final discovery (111f.) using the new metaphor of fate's descent.

ordo : translated by Goold as 'rule', but better construed as metonymy for the fated events in their temporal sequence, which come continuously (*věnit*) to earth from heaven.

120. naturae forma : the physical arrangement (rather than the appearance) of the universe (*OLD* 6; so also at 248, in the context of elemental constitution). *forma* in Manilius only rarely has its primary meaning 'appearance' (1.337, 2.567, 5.101, 325, 516), and almost always corresponds to Gr. *σχῆμα* either in the sense 'shape' or 'arrangement'.

121. sua...sub imagine : 'according to its own appearance'. *sub imagine* here cannot have its normal Ovidian sense 'in the likeness of'. Instead, *sub* should be construed as 'as represented by' (*OLD* 5a; so again at 2.3 *victamque sub Hectore Troiam*, 4.756, 766). Manilius will describe the *totus mundus* 'as represented by its own appearance'; that is, as it is visually perceived by an accurate earthly observer. We have, then, an effective

contrast between the two types of teaching promised, theoretical arguments about the cosmos' constitution (120), and empirically verifiable observations (121).

imagine : the added connotation of the wax mask is apposite. Effectively a three-dimensional model, the wax *imago* is a fitting analogy for Manilius's cosmos, whose curvature is one of its most important attributes (168-214).

mundus : the universe, rather than just the heavens: Manilius's cosmology will include observations about the earth as well as *meteora*.

122-148: Six views on the origin of the cosmos and its smallest constituent parts

Manilius begins by touching briefly upon the two most fundamental questions of cosmology: how did it begin, and what is it made of? Although knowledge of neither issue is required for the lessons to come, he wishes to show awareness of their importance without committing himself to a lengthy discussion. For the sake of economy, presumably, Manilius treats the two questions as a single area of inquiry, allowing him to raise and dismiss both with a single stroke, before moving on to matters of greater importance for his argument. The conflation may strike us as odd, but for an ancient reader both could be understood as inquiries into a single subject, the ἀρχαί or *principia* of the universe.

Six Presocratic opinions are set out using a Lucretian device for listing multiple possibilities (see 122 n.). In keeping with the norms of this device, no proponents are named, and the poet withholds judgement: he leaves such matters for experts to argue over (145f.) and moves on to what can be visibly determined about the cosmos (its *facies*, 147). Of the six theories, the first two deal exclusively with origins while the rest are more

concerned with basic components. Yet a sense of disjointedness is avoided, for in each case some effort has been made to refer to both the event of the universe's inception and its constitution, giving the passage some unity.

Manilius's approach to the issue of origins and components bears some similarity to the Epicurean multiple mode of explanation, as described at Epicur., *Ep. Hdt.* 78-80, *Ep. Pyth.* 86-8 (see also Lucr. 5.526-532, 6.703-711). In cases where our perceptual evidence is not sufficient to identify the specific cause of a phenomenon, an Epicurean refuses to offer a single explanation, settling instead for an exhaustive list of possible causes for the phenomenon. Manilius appears to have taken over this attitude, perhaps from Lucretius: for he too will settle for a list of possibilities if (and only if) the true explanation of a given phenomenon cannot be determined through perceptual evidence (see 718-808 on the Milky Way, 817-875 on comets). The Epicureans, however, never employ the multiple mode to explain events on an atomic level, for although such matters often lie beyond our perception, the relevant theory is too central to Epicurean doctrine to allow for alternatives. For Manilius, however, matters on an atomic level are largely irrelevant, providing an ideal occasion to invoke the multiple mode of explanation.

It lies beyond our power to name the specific sources followed in this passage, but some reasonable assumptions can be made regarding their character. It seems likely that Manilius is using a work in the tradition of *φυσικὰ δόξαί*, or so-called doxographical literature. The earliest surviving representative of this tradition is the 2nd-century *De placitis philosophorum* spuriously attributed to Plutarch (Plut. 874D-911C), henceforth *PP* (on this work and its usefulness for reconstructing earlier examples of the tradition, see Mansfeld & Runia 1997-2009, vol. i 121-195). It has been demonstrated that at least one

text in this structurally-conservative tradition was exploited by Lucretius, whose ordering of material often runs parallel to that in *PP*, and whose own conspectus of opinions on first principles (Lucretius 1.635-920) bears various hallmarks of the *Placita*-tradition (see Mansfeld 1990, 3143-54). A proper exploration of Manilius's relationship with this tradition must be left to the commentary; but let it suffice here to say that enough of its features turn up in the passage to guarantee at least a familiarity with such texts.

As in Lucretius' discussion of the Presocratics, Manilius's theories are ordered according to a numerical principle, something Mansfeld identifies as a mark of doxographical influence (Mansfeld 1990, 3153, 3157-3161): first comes the view that attributes no origin to the cosmos (122-124), then ones that trace it to a single source (125-136), and finally one with several first principles (137-144).¹ Secondly, since the *Placita*-tradition was so conservative in its ordering of the issues discussed, it may be no coincidence that after listing several theories under the subject of smallest constituents, both Manilius and *PP* give only one long version of how the world was constructed (Man. 1.149-171, *PP* 1.4 Πῶς συνέστηκεν ὁ κόσμος).

Manilius, however, does more than epitomise a doxographical source: he conflates two subjects normally differentiated in *Placita*-texts, Περὶ τῶν ἀρχῶν τί εἶσιν (*PP* 1.3) and Εἰ ἀφθαρτος ὁ κόσμος (*PP* 2.4). He also brings in material from elsewhere, at one point paraphrasing Aristotle (see 122-4 n.) and, contrary to doxographic practice, including a mythological cosmogony (125-7).

The absence of the Stoic view need not surprise us: even the most summary account would require a lengthy (and potentially confusing) explanation of the school's

¹ The same numerical principle turns up again in Sextus Empiricus' discussion of first beginnings (*adv. math.* 10.313; see Diels 1879, 91).

distinction between principles (*ἀρχαί*) and elements (*στοιχεῖα*).² More importantly, it is Manilius's wont to keep the involvement of Stoic physical doctrine to a minimum, and to deploy it only when his argument demands it. Whether he believes it or not, this aspect of Stoic physics has little significance for his own teachings and is therefore best omitted. He will limit his assertions in the cosmological section to what directly pertains to his four main claims (see 118-246 n.).

122-4. Some hold that the cosmos has no origin, but is immortal. Manilius is recounting a view attributed to Xenophanes at Cic. *Acad.* 2.118 and Arist. *Cael.* 2.1.1, where it is expressed with striking similarity: οὔτε γέγονεν ὁ πᾶς οὐρανὸς οὔτ' ἐνδέχεται φθαρῆναι, καθάπερ τινὲς φασιν αὐτόν, ἀλλ' ἔστιν εἷς καὶ αἰδῖος, ἀρχὴν...καὶ τελευτὴν οὐκ ἔχων τοῦ παντὸς αἰῶνος.

122. sive : the six views are set out as the disjunctive protases of one long open conditional, whose apodosis does not come until 145. The sentence is only conditional in form, for the truth of the apodosis (*semper erit pugna ingeniis...*) does not depend on that of the protases. On the contrary, the sole function of the protases is to present a series of possible theories. The sense, then, is as follows: 'Whether it is A or B...or F that is true, experts will always argue.' The device is a Lucretian invention (1.977-9, 4.1053f., 5.519-25, 5.575-8, 5.1244-9), but only Virgil uses it at a comparable length, and only once (*G.* 1.86-93). Manilius employs the device once again (865-875) to list the possible causes of comets.

² See White 2003, 124-152. The term *στοιχεῖον* alone would have posed further problems, as it is used, at least by Chrysippus, in several contrasting senses: see Cooper 2009, 93-115.

ex nullis repetentem semina rebus : ‘not tracing its elements back to any source’. This sense of *repeto* (*OLD* 7b) with *ex* is classically attested but rare: e.g. Bith. *Fam.* 6.16 *repetere initia amicitiae ex parentis nostris*, Sil. 3.100 *ex sacrata repetebat stirpe parentes*.

semina : the first of several synonymous terms used in the passage to denote elements, presumably for variation. There follow *rerum primordia* (125), *individuis principiis* (128f.) and *elementa* (144). Although elements are largely irrelevant to this opinion on the origin of the cosmos, Manilius has presumably brought them in here to afford greater unity with the theories to come.

123. natali quoque egere : repeats the idea of the previous line in more straightforward language, and introduces the recurrent image of the universe as an organism.

124f. semperque...carentem : again a single idea is expressed in two different ways. Here, however, Manilius is probably adapting Aristotle’s wording, οὔτε γέγονεν...οὔτ’ ἐνδέχεται φθαρῆναι, ... ἀρχὴν...καὶ τελευτὴν οὐκ ἔχων. (See 122-4 n.)

fato : continues the personification of the universe. *fatum* ‘death’ is often used of inanimate things (such as the Republic), but always in a clearly figurative manner.

125-7. Or Chaos separated the elements of matter; the darkness, having given birth to the universe, fled into the shadows below. This is generally thought to be Manilius’s interpretation of Hesiod’s cosmogony at *Th.* 116-123:

ἦτοι μὲν πρότιστα Χάος γένετ’· αὐτὰρ ἔπειτα

Γαῖ' εὐρύστερνος...

...

ἐκ Χάεος δ' Ἐρεβός τε μέλαινά τε Νύξ ἐγένοντο.

For although it deviates from that account on several points, Manilius attaches the same theory explicitly to Hesiod at 2.12-14 *Hesiodus memorat... | chaos enixum terras orbemque sub illo | infantem*. Manilius may be giving his own imaginative reading of the passage, or may be recounting a separate Hesiodic version, perhaps from the lost *Astronomia*, which Manilius seems to know (see 2.18, 24-27).

125. permixta...rerum primordia : as at 122, Manilius shoehorns in a reference to the basic constituents of matter, which eases the transition into the four remaining theories.

126. nitentem : shining with the light from the heavenly bodies. The detail is brought in to contrast the *mundus* with the former *caligo* (127).

127. caligo : the alleged mother of the universe (*mundumque enixa*), possibly to be identified with Hesiod's μέλαινά Νύξ (*Th.* 123), the parent of Αἰθήρ and Ἡμέρη (*Th.* 124). Alternatively, Manilius may be alluding to the version of the cosmogony recorded at *Hyg. Fab. praef.* 1, which begins, *Ex Caligine Chaos*. The best candidate, however, may be Chaos itself, as suggested by 2.13 *chaos enixum terras orbemque*.

128-131. Or nature is a random aggregate of atoms, bound one day to dissolve and reform

again. This is the opinion of Leucippus and Democritus (KRS § 555-72), followed later by the Epicureans. Though he reserves judgement here, Manilius will later reject this view outright (474-500).

130. paene ex nihilo summa est nihilumque futurum : the antithesis mimics a recurrent formula found in *Placita*-chapters on first beginnings (e.g. *PP* 1.3 *passim*): (λέγει) ἐκ Χ γὰρ τὰ πάντα γίνεσθαι καὶ εἰς Χ πάντα τελευτᾶν (φθείρεισθαι, ἀναλύεσθαι). We may also detect a playful nod to *Lucr.* 1.156f. *viderimus nil posse creari* | *de nilo*.

nihilum (for *nihil*) is a striking archaism. It is otherwise avoided in Augustan verse, but occurs 11 times in the *DRN*, giving Manilius's summary of atomism an appropriately Lucretian ring.

131. caecaque : probably 'random, without purpose' (so at 493 *caecoque...foedere*) rather than 'invisible'; for as 474-500 reveals, chance plays a central role in Manilius's understanding of the atomist cosmogony.

132-134. Or fire has fashioned the universe. This is the view of Heraclitus,³ albeit tailored slightly to suit an inquiry into absolute origins. For Heraclitus, the cosmos is an eternal fire, parts of which are being constantly extinguished and rekindled to produce earth and sea (see KRS § 197-9). To say, therefore, that fire *has created* the cosmos (*ignis fabricavit opus*) misleadingly suggests that the creation is a historical event when it is, in fact, an

3 The doxographers (*PP* 1.3, *Stob. Ecl.* 1.10.12; cf. *Sext. Emp. adv. math.* 10.313), following Aristotle (*Met.* 1.3) attribute the same theory to Hippasus of Metapontum. Manilius may therefore have both philosophers in mind here.

everlasting process.⁴ We should, however, expect no less from Manilius, who, for the sake of consistency with the earlier theories, is keen to include a mention of origins in those theories that are more concerned with basic constituents.

133. mundi...oculos : the stars. While eyes are often likened to stars (e.g. Prop. 2.3.14, Ov. *Met.* 1.499, Man. 4.907), the reverse metaphor is rare. The only precedent for referring to the stars as eyes is *Anth. Pal.* 7.669, a Hellenistic epigram attributed to Plato. But a likelier influence here, perhaps, is Ov. *Met.* 4.228 which calls the Moon the *mundi oculus*. Whatever the source, it adds a further dimension to the personification of the cosmos (see 118-246 n.).

133f. habitantque per omne | corpus : the flames do not dwell ‘throughout the whole system’ (Goold): for in Heraclitus’ view, the cosmos is only ever partly comprised of fire (see KRS § 218f. with commentary). It makes better sense to see the flames as dwelling ‘throughout every (human) body’ (*per omne corpus*); that is, in the form of a soul, which for Heraclitus consists of fire (KRS § 229-232).

134. vibrantia fulmina fingunt : the thunderbolt seems to have played a role in Heraclitean theory, as suggested by fr. 64 (KRS § 220) τὰ δὲ πάντα οἰκίζεῖ κεραυνός, and an allusion may be intended here. Alternatively, Manilius may be playing here on the thunderbolt’s role as a symbol for scientific explanation (cf. 104f.).

4 At all times there must be an equal balance between the parts of the cosmos that are fire and the parts that are not (see Heraclitus fr. 31, 90 = KRS § 218f.).

135f. Or the universe was born from water (so Thales). Contrary to the claims of the doxographers⁵ Thales' cosmos is not *composed* of water, but has come out of water in some other sense, perhaps by a process of solidification (see KRS pp. 89-91). Manilius's desire to mention origins (*peperit*) therefore has the lucky consequence of making his summary of Thales' view more accurate than that presented elsewhere.

135. *peperit* : the metaphor captures the biological focus of Thales' theory (at least as presented in *Placita*-texts), in which moisture is a prerequisite of the birth of living things (*PP* 1.3 [Thales] στοχάζεταιται... ὅτι πάντων τῶν ζώων ἡ γονὴ ἐστὶν ὑγρὰ οὐσα).

136. *ipsumque vorat* : a conjunction (*-que*) occurs in place of another relative pronoun (*qui*), despite the change of case (see Kühner-Stegmann II ii 323f.). Manilius's use of the idiom is probably influenced by Verg. *A.* 12.942-944, where *atque cuius* (after *quem*) is replaced simply by *atque*.

137-144. Or earth, fire, air and water are the four indivisible elements of the universe, by whose combination all things are created (so Empedocles). Manilius mentions Empedocles' four corporeal elements, but wrongly denies the existence of anything else (139f.). For Empedocles, however, there are two more basic units, the forces of *φιλία* and *νεῖκος*, to which Manilius only briefly alludes (see 142 n.). For Empedocles, these two forces are responsible for the creation and destruction of all things; but according to Manilius's picture, the four elements are themselves the creators. Perhaps Manilius wants

5 *PP* 1.3 = Stob. *Ecl.* 1.10.12 [Thales] ἐξ ὕδατος <γάρ> φησι πάντα εἶναι καὶ εἰς ὕδωρ πάντα ἀναλύεσθαι. The confusion appears to have originated with Aristotle (*Met.* 1.3, 983b6).

to limit his discussion to corporeal entities; but I suspect, also, that he saw an opportunity to advance his personification of the cosmos.

137. aut : *aut* for *sive/seu* goes against the norm of the device, but has a precedent at Verg. A. 12.686.

137f. neque terra...nec flamma...nec aer | aut umor : Manilius plays with and reverses an established poetic trope, whereby the four elements are concisely listed, each separated by a conjunction. Empedocles himself initiated the trope, as several fragments testify (e.g. fr. 25 Inwood/17 DK line 18 πῦρ καὶ ὕδωρ καὶ γαῖα καὶ ἠέρος ἀπλετον ὕψος). Later it is taken up by the Latin poets (e.g. Enn. 221 Skutsch, Lucr. 1.706, 1.715). Manilius employs it several times in the traditional manner (1.249, 3.52, 4.889), but here replaces the positive conjunctions with negatives.

138. faciuntque deum per quattuor artus : a striking personification, presumably alluding to the divine identities of Empedocles' elements: Zeus, Hera, Nestis and Aidoneus (fr. 12 Inwood/6 DK.2-3).

141. nec...desint : if Manilius understands the Empedoclean theory, he cannot be claiming that wet is never absent from dry (or cold from hot), but simply that two elements of contrary character (e.g. water and fire) often occur in combination.

142. discordia concors : the passage's sole allusion to Empedocles' forces of Love and

Strife (fr. 25 Inwood/17 DK.6-8). Manilius has reversed an oxymoron found in earlier poems, *discors concordia* (Ov. *Met.* 1.433; cf. Hor. *Epist.* 1.12.19 *rerum concordia discors*).

145. pugna in geniis : Housman's emendation is preferable to the unanimously transmitted *genus in pugna* ('the origin [will always be] under dispute'), for this sense of *in pugna (esse)* is found nowhere else.

dubium : not necessarily an admission of doubt on the poet's part, but perhaps simply 'on which there is no general agreement' (*OLD* 6).

148. convenit : two senses are at play, not merely 'it is agreed upon', but also 'it is in agreement (with itself)', anticipating the final lesson of the cosmology, that the universe is a unified and harmonious whole (247-254); see Volk 2009, 29f.

digestum est : *digestum* is normally taken as adjectival, with *est* as the copula. But if the two words are read as a perfect passive ('has been set in order'), the connection with the following creation-narrative becomes more natural.

certo...ordine : perhaps a veiled criticism of Ovid's creation (*Met.* 1.26-31), which in placing earth before water deviates slightly from the strict Stoic order followed by Manilius.

149-172: The creation of the universe

Manilius now offers the first of two different but complementary accounts of the creation.

While the second (3.47-60) presents the cosmogony from the perspective of a divine creator (Nature), the first describes the creation as a mechanical process. No creator-figure is named; instead, the four traditional elements find their places and form the cosmos as if by their own guidance. First, we are told, fire rose to the aetherial regions and gave the universe its boundary (149-151). Next breath sank down and spread air through the middle of the world's empty space (152f.). Third came water, which feeds the air, which in turn feeds the fire (156f., 154). Earth, lastly, sank to the bottom in a ball; the water drained from it, leaving land separate from sea, though surrounded on all sides by ocean (159-166). The sky is at all points equidistant from it, and the resulting centripetal force keeps the earth stable (168-172).

On a first reading, the creation-narrative may come rather unexpectedly: Manilius has told us that the universe's origin must remain disputed and that such matters lie beyond man's ken (145f.). To understand the connection with the preceding passage, we must realise that it does not contain another cosmogony to rival the theories at 122-144, but has moved on to a new topic: 122-144 only concerned the question of the absolute beginnings of the universe. 149-172, on the other hand, addresses the subsequent stages of its development, leaving aside matters of its origin and first principles. We need not conclude that for Manilius the four elements are the very smallest constituents of the universe, but merely that they are the smallest visible units.

The first purpose of the passage is to provide a sketch of the *facies rerum* (the one thing on which philosophers agree (147f.)) in a way that allows Manilius to play upon a poetic commonplace, the creation-narrative. Manilius engages with several earlier examples of the feature, most importantly the Epiurean *διακόσμησις* at Lucr. 5.416-508,

part of which he reworks in his own narrative (see 160-166 n.). The stylistic similarity with Ov. *Met.* 1.24-31 and Verg. *Ecl.* 6.31-6 suggests that these cosmogonies may also have served as models for Manilius's. An equally important parallel comes from a prose text, Cic. *ND.* 2.115-118, whose straightforward description of the four levels of the universe contains many of the same details (see below *passim*), only with the levels treated in reverse order (earth, water, air, fire). It is very possible, in fact, that Manilius has derived much of his material from this Ciceronian passage (hence their common descriptive purpose), and adapted it to suit a common narrative form. At any rate, there is no important theoretical detail in Manilius's narrative that cannot also be found in the second book of the *De natura deorum*.

The second purpose of the narrative is to set the stage for the five fundamental claims of Manilius's cosmology (see 118-246 n.): it gives a historical explanation for the centrality (169f.), stability (168) and sphericity (159) of the earth, properties which Manilius will argue for at length (173-235). Moreover, by pervasively personifying the elements as deliberate agents of creation, Manilius's hints in advance at his belief that the universe was not formed *forte magistra* (485) and 'is itself a manifestation of God' (Goold tr. 486 *ipsumque esse deum*). If we accept the detail of Manilius's narrative, we should be more inclined to share his belief in a divine force that unifies the cosmos (247-254) and regulates its movements (188f.). In this respect too it mirrors the Ciceronian passage, which sets out to show that the universe is not the work of chance, and is pervaded by a divine spirit (Cic. *ND* 2.84, 115).

There is some disagreement as to whether Manilius's narrative aligns itself specifically with Stoic cosmogonical doctrine (see Luck 1984 and Feraboli-Scarcia ad

loc.), or whether its details were so commonplace by Manilius's day that his readers would not have linked them with any one school (Volk 2009, 30f.). The inclusion of Epicurean material at 160-166 (see n.), though not inconsistent with Stoic theory, confirms at least that Manilius is no doctrinaire Chrysippean. However, a Stoic base seems certain, for unlike *Ov. Met.* 1.24-31, Manilius stays true to the ordering of the four elements in the Chrysippean *διακόσμησις* (Cic. *ND* 2.84) and hints at the reverse sequence of transformations, another crucial Stoic mechanism (see 157f. 154 n.). But the passage is no summary of the Stoic creation. The most important points of physical doctrine are either omitted or (more often) alluded to in a way that could only be recognised by someone already familiar with them. There is no *explicit* mention of a creating force, or the transformation between elements (the Stoic theory of four elements is not properly described until 247ff.), of the *πνεῦμα* that bind the universe together (252f.), or the theory of conflagration and rebirth. We may explain these gaps as follows: Manilius wishes to present his account as uncontroversial (*facies...convenit*, 147f.). Beginning from an orthodox Stoic account, he has removed as many details as possible that conflict with the various cosmogonies described at 122-144. Thus he creates the illusion of an account that is 'generally agreed upon' (*convenit*), while it is in fact essentially Stoic.

149. ignis...se sustulit : recalls *Lucr.* 5.458f. *primus se sustulit aether | ignifer*. For the Stoics, fire is the only element existing at the start of each world cycle (DL 7.142, L-S 47A3 = *SVF* 2.413) and appropriately comes first in Manilius's creation. By making fire the agent of *sustulit* and *fecit* (151), Manilius may be hinting further at the earlier Stoic belief in a 'designing fire' (*πῦρ τεχνικόν*) responsible for the initial stages of cosmogony

and identifiable with God (see L-S 46, Cic. *ND* 1.36). **volucer** ‘winged’ adds a further personifying force.

aetherias : for the Stoics, ‘aether’ is not a distinct element, but the part of the fiery region that is uppermost and contains the stars (DL 7.137, *SVF* 2.527.28-30).

150. stellantis culmina caeli : i.e., the region of the aether (see 149 n.). The expression is modelled on Verg. *A.* 7.210 *stellantis regia caeli*, but with the more precise modification *culmina* to denote the very uppermost part of the heavens.

151. flammorum vallo naturae moenia fecit : the aetherial fire constitutes the boundary of the finite Stoic cosmos, beyond which is infinite void (DL 7.140, Cleomedes 1.1). The metaphor is a slight expansion upon Lucretius’ *flammanitia moenia mundi* (1.73; cf. 1102.), which too are created from the lightest form of matter (Lucr. 5.474-7). The metaphor recurs in Manilius’s attack on Epicurus (1.486) and, significantly, in the second creation-narrative (3.48).

152. spiritus : *spiritus* and *aura* normally both denote air in motion, but are apparently distinguished here. However, *spiritus* is also the usual calque for *πνεῦμα*, the Stoic active principle identifiable with God and the world-soul (Cic. *ND* 1.39; see 247-254 n.), and hence also with the seminal principle that orchestrates the creation (DL 7.135f.). This, then, is the likeliest sense here: for like *ignis* (149), the *spiritus* is presented as an active force (153).

153. extendit per inania mundi : like the Stoics (DL 7.140, Cleomedes 1.1.9), Manilius makes no allowance for void (*inane*) within the cosmos: any pre-existing space within the cosmos-to-be is now filled by the *aer*. Although the phrase *per inania mundi* recurs (200, 283), both later instances encourage a looser reading, ‘through a part of the cosmos occupied by no obstructing body’ (compare Sen. *Nat. quaest.* 3.10.2 *per vastum caeli spatium*).

155. tertia sors : the agent of creation changes from *πνεῦμα* (*spiritus*) to destiny. The Stoics could explain creation in four equivalent ways, as the work of God, Reason, *πνεῦμα* or destiny, and saw all four explanations as essentially one (Sen. *Dial.* 12.8.3).

fluctusque natantis : ‘floating billows’ (Goold); cf. *undamque natantem* in the second cosmogony (3.52). Both depart slightly from their Lucretian model, *camposque natantis* (5.488), as if to point out that it is not the entire *campi* that seem to be swimming or floating, but the waves that move upon them.

157f. 154. Housman’s transposition of 154 after 158 restores the likeliest progression of ideas, describing the ‘upward’ sequence of transformations between the Stoic elements: [earth turns to water,] water to air, air to fire (Cic. *ND* 2.84, DL 7.142, L-S 47A4). The theory of reciprocal changes is not vital to a sketch of the cosmic structure, but helps develop our impression of the cosmos as an organism made up of interlinking parts. We may also identify a broad allusion to Ovid’s more extensive poetic treatment of the same transformations (Ov. *Met.* 15.239-51).

157. liquor exhalet...evomat : the second verb expands upon a Lucretian image (5.463 *exhalant...lacus...fluviique*), giving a stronger personifying force to a dead metaphor.

158. aeraque...ducentem semina : the collective mass of air absorbs (or 'inhales': *duco*, *OLD* 25) further individual corpuscles of air from water (*ex ipso*, sc. *liquore*). On the technical sense of *semina* here see 122 n.

158. 154. pascat...alat : the image of one element 'feeding' another is an established metaphor of Stoic elemental change: the aether draws *alimentum* from the *halitus terrarum* (Sen. *Nat. quaest.* 6.16.2f., cf. Cic. *ND* 2.118), while the earth is nourished (*alitur*) by the elements about it (Cic. *ND* 2.83). The image is not exclusively Stoic, however: a further, poetic influence may come from Lucr. 1.231 *unde aether sidera pascit?* (cf. 1.816).

154. vicinis...astris : i.e. the uppermost, and so lightest, air. Cf. Cornutus 17 τὸ δὲ λεπτομερὲς τοῦ ἀέρος γέγονε πῦρ.

subditus : a further hint at a deliberate organising principle behind the cosmos.

159. glomerato pondere : the earth's weight gives it its spherical shape, a property which Manilius will argue for at length (206-35). On this Stoic belief see Cic. *ND* 2.116, *SVF* 2.527 and (in great detail) Cleomedes 1.6.

160-166. Water, being lighter, gradually filtered out of earth until the two constituted distinct masses; water settled in valleys and mountains rose from the sea, but land was still surrounded by ocean. This theory of separation through filtration is clearly derived from Lucr. 5.487-508 and has no Stoic basis. It is nonetheless consistent with a Stoic cosmogony, in which the elements find their places according to their density, and its addition here offers ample room for Lucretian allusion.

161. paulatim : a suitably Lucretian adverb, occurring 23 times in *DRN* and most often in line-initial position. Here *paulatim* captures the gradual nature of the process, mirroring Lucr. 5.488 *augebat mare manando*.

163. saccatum : ‘filtered’ (literally, through a bag): a rare and colourful word whose only earlier occurrence in Latin is at Lucr. 4.1028 *totius umorem saccatum corpori’ fundunt* (of children dreaming that they are urinating). Manilius may have chosen the word for its bodily connotations, wishing to give his line some of the metaphorical power of its model, Lucr. 5.486 *tam magis expressus salsus de corpore sudor*.

165. emersere fretis montes : cf. Lucr. 5.492f. *crescebant montibus altis | ascensus*. Mountains make a brief showing in other cosmogonical narratives: cf. Apollon. 1.501 [Ἥειδεν] οὐρεά θ’ ὡς ἀνέτειλε, and less directly, Verg. *Ecl.* 6.40 *rara per ignaros errent animalia montis* (alluding to the θηρῶν ὀριπλάγκτων of the Empedoclean cosmogony: fr. 25 Inwood/17 DK.65).

[167]. Since *ima* (167) and *clausus* (166) cannot agree with the same noun, 167 cannot belong after 166. Housman and Goold place 167 after 214 (see my n. after 214n.); Flores deletes it. The best solution (so Luck 1984, 31) is to place 167 after 159, where it completes the running pattern of element-name followed by eventual location. 167, moreover, corresponds closely with a detail from the later, parallel cosmogony (3.50 [orbem] *undique pententem in medium*), strongly advocating its inclusion in the first creation-narrative.⁶

168-170. The earth remains stable because the heavens are at all points equidistant from it, and by falling (i.e. pressing) upon it from all sides they stop the earth itself from falling. Aristotle (*Cael.* 297a8-13) first gives this pressure as a reason for the earth's sphericity, and the argument is later adopted by the Stoics to defend its stability at the centre of the universe (*Cic. ND* 2.115f.; *SVF* 2.550, 554).

168. idcircoque : first used extensively in verse by Ovid (14 times), *idcirco* occurs four times in under 500 lines of Grattius, all in line-initial position. Manilius takes the trend the furthest with 12 instances in the *Astronomica*, and is notably the last classical poet to use the word (with the one exception of *Juv.* 9.119). That all 12 also occur in first position suggests a specifically Grattian influence.

169. tantundem : typically a prose word, its use in Augustan verse is otherwise limited to Germanicus and Horace's *Satires* (e.g. 1.1.52, 56). Here Manilius's influence must be

⁶ Luck's reason for the transposition – that a line is unlikely to have moved as far as 48 lines back – is unfounded, but has offered a fortuitously plausible solution to an old problem.

Lucr. 5.494 *nec pariter tandundum omnes succumbere partis*, from a passage he has just reworked (see 160-166 n.).

cadendo : the ablative gerund lends a further Lucretian flavour.

170. ne caderet : the final (rather than consecutive) clause hints further at a divine purpose behind the construction of the cosmos.

medium...et imum : for the view that the centre and bottom of the world are the same cf. Cic. *ND* 2.84 *medium locum qui est infimus*, Lucr. 5.451 [*terrae corpora coibant*] *in medio atque imas capiebant omnia sedes*. The expression has the ring of a paradox, but matches the modern intuition that the lowest (or deepest) point of the earth is at its centre.

[171f.] Routinely rejected since Bentley, the lines lack a suitable conjunction to join them logically to what proceeds: since they explain the general physical law underlying 168-170, we would expect *nam* or *enim* rather than *-que*. However, given their close correspondence with part of the Lucretian model (5.484-6), it is tempting to see the couplet as genuine, but merely lacking the author's final polish (so Luck 1984).

173-246: The position and shape of the earth within the universe

While the creation-narrative explained *how* the earth came to be poised at the centre of the universe (168-170) and of spherical shape (159-166), Manilius still feels he must persuade us *that* these things are true. In a barrage of supporting arguments, he now sets aside theoretical considerations in favour of appeals to the reader's perceptual experience.⁷

⁷ The move mirrors one in Aristotle's discussion of the earth's shape (*Cael.* 297b-298a).

Philosophical and logical rigour is of less importance here than rhetorical appeal: Manilius is out to persuade rather than to prove.⁸ Yet the arguments on display – even the erroneous ones – have a foundation in the traditions of cosmological enquiry, and show some awareness of established argument-forms (see 173-178, 228f. nn.).

The first set of arguments addresses the earth's centrality (173-181) and its suspension in space (194-201), with a brief digression in defence of a related and equally important claim, that celestial motion is regular (182-193). In the second set (206-234) Manilius argues for a round earth, then dwells upon one presumed consequence of this fact: the existence of the antipodes (236-246). The whole passage, in short, sets out to defend four of the five physical theses on which Manilius's astrology depends (see 118-246 n.). The fifth thesis, which will prove to be more an article of faith, is reserved for the climax of Manilius's cosmology at 246-254.

In contrast with the creation, this part of the cosmogony has no poetic precedents to serve as models or objects of allusion. Since the poetic tradition furnished Manilius with only a limited vocabulary for the subjects at hand, he does not always manage to avoid repetition. Where possible, however, Manilius opts for extensive variation of diction, employing a wide range of terms expressing movement and roundness (207n.), and signposting his arguments with the full range of logical adverbs and conjunctions. Further rhetorical-poetic ornamentation is found in the form of etymological wordplay (173, 233) and an *invocatio* to the Moon (221-227), as well as Manilius's characteristically dense verbal allusion.

173-181. *The earth hangs balanced at the centre of the universe.* If it did not, then the

8 On this aspect of the passage see especially Abry 2005.

heavenly bodies, having set, would not rise again. Manilius seems to believe that the only alternative to a central position is for the earth to lie at the bottom of the universe (179). Otherwise, the first premise of his argument is false (were it to lie, say, slightly west of the centre, the Sun would still rise and set, albeit with different hours of night and daylight). The argument successfully proves that the earth does not lie at the ‘bottom’ (or edge) of the universe, for in that case the heavens could not pass beneath it to rise again. But as a proof of the earth’s *centrality* it is clearly problematic. I suggest that Manilius is relying on a slip between two senses of *medius* and *medium*, the first denoting (less precisely) the ‘midst’ (180, contrasted with 179 *imo...profundo*) and the second denoting the very centre of a thing (170, 204 etc.). Thus, by proving that the earth lies in the ‘midst’ of the universe (i.e. not at its edge: *medium OLD 2*), he creates the false impression of proving its centrality.

The argument is found nowhere else. Other authors appeal either to physical causes (Arist. *Cael.* 296a-297a, Cic. *ND* 2.116, Ach. 4) or to more detailed observations (Plin. *NH* 2.176, Cleom. 1.6). The peculiar character of Manilius’s argument may derive from his keenness to employ empirical (rather than theoretical) argumentation (see 173-246n.): for if his source belongs purely to the former type, then he will have had to rely on his own ingenuity in defending the earth’s centrality. We cannot know what kind of work Manilius drew on, but the correspondences with Achilles’ *Eisagoge*, an astrolomical handbook possibly dating to the third century AD, may point to a direct ancestor of that work (see p. 51, n. 63 and comm. 179 n.).

Though Abry has questioned the argument’s logic (Abry 2005, 255), it belongs to a type commonly found in natural philosophy, a use of the Stoics’ ‘second undemonstrable’

(= *modus tollens*; see L-S 36A11) involving a counterfactual: if *P* were true, *Q* would be true; not-*Q*; therefore not-*P*. In Cic. *ND* its use is limited to the Stoic speaker Balbus, but the argument-type was not exclusively Stoic: in fact, its frequent use in Lucretius (1.180, 356f. etc.) is likely to have influenced Manilius, who employs it a further six times (228f., 461f., 827-830; 2.67-79, 804-807; 5.743-5).

173. quod nisi : Goold's emendation is preferable to MSS *quod ni*: aside from Manilius's apparent preference for *ni* over *nisi*, *quod nisi* is a common line-opening in earlier hexameters, whereas *quod ni* is not found in that position before Statius and Silius.

librato penderet pondere tellus : the wording is clearly derived from Ov. *Met.* 1.12f. *nec circumfuso pendebat in aere tellus | ponderibus librata suis*, but arranged so as to highlight the etymological play *penderet pondere* (for which cf. Cic. *Verr.* 2.4.1, Liv. 38.38.13).

174. non ageret currus : the first of the passage's many expressions of celestial movement. The metaphor helps clarify the point for any reader unfamiliar with the idea of the heavenly bodies as large, three-dimensional objects: there must be room between the earth and the universe's edge for the chariot of the Sun to pass.

There is widespread confusion of *currus* and *cursus* in the textual tradition of this passage, and occasionally an emendation of one to the other, though unnecessary, may be preferable. Here, Bentley's emendation of MSS *cursus* to *currus* restores a common metaphor and avoids repetition at 176, and so deserves favour.

175. Phoebus : Apollo, having served as Manilius's musical inspiration (19), now takes

up his main role in the *Astronomica* as metonym of the Sun.

176. reget...cursus : the expression has a nautical flavour (so at Verg. *A.* 6.350, Plin. *NH* 5.128; cf. Val. Max. 9.8.ext.1 *cursus rectorem*), offering an effective contrast of image with the chariot of Phoebus.

per inania : see 153 n.

177f. Manilius was surely aware that Venus does not appear as both morning-star and evening-star within a single 24-hour period;⁹ but as Goold (ad loc.) points out, he wishes to follow a string of earlier poets in neglecting this detail (cf. Anth. Pal. 12.114, Cinna fr. 6 Morel, Catull. 62.33-35, *Ciris* 351, *Elegiae in Maecenatem* 1.129-132).

178. Hesperos : the orthography varies among the poets between *-us* (Catullus, Virgil, Ovid) and *-os* (Ovid, Germanicus).

emenso...Olympo : a convincing emendation from MSS *inmensio*. The phrase, along with its metrical position, is borrowed from Verg. *G.* 1.450 (cf. 2.836 *emenso...mundo*, Ov. *Met.* 15.186 *emensas...noctes*).

179-181. Having shown that the earth lies in the midst of the universe and not at its bottom, Manilius explains one consequence of this fact: the space around it provides room for the night sky to set (*cadat*), pass under it (*subeat*) and rise again (*resurgat*). This, of course, tells us nothing that could not be deduced from 173-178, but simply serves to drive the point home.

⁹ Germanicus, whom Manilius had read, hints at a greater awareness of these matters (fr. 4.73-6).

179. nunc: marks, in Lucretian fashion (e.g. 1.110, 6.570), a change from what is untrue to what is true: see Munro 1928 on Lucr. 1.169.

imo...deiecta profundo : a reference to the view of Xenophanes (KRS § 180) that there is sky above the earth but nothing below. Compare Ach. 4, Ξενοφάνης δὲ οὐκ οὔεται μετέωρον εἶναι τὴν γῆν, ἀλλὰ κάτω εἰς ἄπειρον καθήκειν. In both Manilius and Achilles this is the only alternative given to a suspended earth, a further sign that Manilius may be working with an ancestor of the *Isagoge*.

180. medio : ‘in the (universe’s) midst’ (*OLD* 2) rather than ‘at the centre’ (*OLD* 1). If these lines are to masquerade as a proof of the earth’s centrality, Manilius must engineer a slip from the former sense to the latter (see 173-181n.). This is achieved through an ambiguous use of *medio* here, in anticipation of the mention of centrality proper at 201f.

suspensa manet : borrowed from Lucr. 6.1128, with metrical position retained.

sunt pervia cuncta : ‘all the space about it affords passage’ (Goold). On its own, *cuncta* is troublesomely vague. But, since obvious nouns were omitted at 179 and 180, *cuncta* seems more natural if we assume a suppressed genitive here too (i.e. *caeli*), producing a phrase of similar character to Lucr. 5.739f. *cuncta...viai*.

182-193. *Celestial motion is entirely regular; the heavenly bodies are not born anew each day.* Having just mentioned (181) that the heavenly bodies, having set, move around the earth and rise again, Manilius now justifies the two claims on which that assertion depends. The connections between these claims and what precedes are not immediately

obvious, and give the lines the sense of a Hesiod-like chain of association.

Of the two claims defended here, the former is the more important, being one of Manilius's five fundamental theses (see 118-246n.). The question of daily renewal is tied to this by the following implied supposition: if the heavens were born anew each day, they would err in their movements (187-189). Manilius, then, cannot leave us in any doubt on this matter if we are to believe in celestial regularity. The observation that the heavens have not changed over time (185) is enough to secure our faith on both counts. Nonetheless, Manilius adds a further piece of evidence against daily rebirth, that the Sun in its orbit is always shining on some part of the earth (189-193), providing a link with the following discourse on the earth's sphericity (204-246).

But why involve the question of daily rebirth at all? The belief does not seem to have carried any weight in Manilius's day. It had, however, been held by Xenophanes (see KRS § 175, with commentary),¹⁰ whose theory on the earth's position Manilius has just refuted (see 179n.). Perhaps, having discussed Xenophanes' belief that there is nothing below the earth, Manilius feels he must mention (and refute) the other, its logical consequence: if there is nowhere for the Sun to go when it disappears, it must be a new Sun that rises the next morning.

182. nam : presents the following argument as a response to the preceding claim (181) that the night sky moves around the earth.

fortuitos : see 185-193n.

surgentibus astris : something of a formula for Manilius. The line-ending, drawn from Verg. *G.* 1.440, recurs twice (3.286, 5.126).

¹⁰ This view was shared by Heraclitus (KRS § 225).

183. nascentem : the subject of rebirth prompts a string of biological metaphors (*partus, fata, facies*) familiar from the cosmogonical section (122-148).

possum...credere : this proclamation of disbelief strongly recalls Cic. *ND* 2.54, where the same evidence is used to reach a related conclusion: *hanc igitur in stellis constantiam, hanc tantam tam variis cursibus in omni aeternitate conventiam temporum non possum intellegere sine mente ratione consilio.*

184. solisve : the Sun is, properly speaking, part of the *mundus* (183), but earns a special mention as the central concern of Xenophanes' theory (see 182-193n.).

185-193. In one long causal clause, Manilius provides a list of observational details confirming the regularity of cosmic motion, underscoring the point through repetition: *eadem, idem, isdem, totidem, eadem.* The weight placed on observation here may have been prompted by Cic. *ND* 2.97 *Quis enim hunc hominem dixerit qui, cum tam certos caeli motus...viderit, neget in his ullam inesse rationem, eaque casu fieri* (cf. 182 *fortuitos dicat...?*)

187. luces...orbis : Goold (comm. ad loc.) rightly sees a contrast here between *lucēs* 'days' (a common sense in Manilius: see 3.229, 263, 349, etc.) and *orbēs*, with the latter referring to the Moon's changing appearance (cf. 527). Goold's 'phases' presses the sense of the word too far; '(visible) discs' demands less of a stretch (we thus get one *orbis* each lunar month) and more closely matches the word's sense at Ov. *Met.* 7.530, 15.198.

188. natura vias servet, quas fecerat ipsa : Nature appears here in her Stoic role as governor and sustainer of the creation, as presented at Cic. *ND* 2.82: *dicimus natura constare administrari mundum...ut arborem ut animal, in quibus nulla temeritas sed ordo apparet et artis quaedam similitudo.*

189. nec tirocinio peccet : the military term *tirocinium* ‘first campaign’ – which occurs nowhere else in verse – brings the absurd implication that Nature, the creator, is acting under orders, heaping further implausibility upon the rejected view.

189-193. The final piece of supporting evidence is targeted specifically at the theory of rebirth: the Sun in its orbit is always illuminating some part of the earth. To comprehend this properly, we must have some understanding of the properties of a spherical earth. Manilius accordingly provides an illustration (192f.): the further you walk towards them, the sunrise and sunset never get any closer.

192f. ortus ad ortum | occasumve obitus : the first of two chiasmic arrangements that mimic the earth’s contour (cf. 205 with n.).

193. caelum et cum sole perennet : the night sky lasts as long as the Sun; that is, it is not reborn anew at the start of each night. This final conjunct in the causal clause completes the refutation of the rebirth-theory as presented by Manilius, which claimed that not just the Sun but the whole *mundus* (183) is new every day. For the phrasing, cf. Ov. *Fast.*

1.721 *domus...cum pace perennet.*

194-201. *The earth's suspension in space is to be expected.* Anticipating our surprise at the idea, Manilius invokes the analogy of the celestial sphere and planets, which can be seen to 'fly' over us (197-200), to show that a suspended earth conforms to natural laws (201). The bulk of the argument is packaged in a string of causal *cum*-clauses and substantial repetition is used to drive the point home (*pendentis, pendeat, suspensus, pependit*), mirroring the tactics of the preceding argument.

Earlier authors present the phenomenon of a suspended earth merely as the result of physical laws, without recourse to analogy (Cic. *ND.* 2.116, Arist. *Cael.* 296b-297a; see also 202-205n). Manilius himself had done the same (169f.), but must now defend the belief relying only on empirical support. While this kind of argument by analogy is alien to Stoic cosmology, it does have a strong precedent in the Presocratics: Empedocles, for instance, claims that the earth's suspension in space is secured by the motion of the heavens around it, drawing the analogy of water that remains in a bucket when it is swung around above someone's head (see Arist. *Cael.* 295a16-30 with Lloyd 1966, 334). Other analogies illustrating the same point turn up in Ach. 4, which, if they were a traditional feature of this type of astronomical prose manual, may have influenced Manilius's use of analogy here. However, in keeping with the rest of the passage, Manilius limits his observations to heavenly, rather than terrestrial, phenomena.

194. Most MSS contain the unmetrical *tibi natura admiranda*, leaving us with a choice between mv's *natura tibi admiranda* and Ellis' *admiranda tibi natura*. Based on the

statistics of Liuzzi & Pecorella 2002, the latter is slightly likelier metrically: Book 1 has five lines with third-trochee and hepthemimeral caesuras, but only two with third-trochee and trithemimeral. The difference is too slight to be confident, but with no other criteria to judge by, Ellis' ordering must be preferred.

198. currusque reflectat : MSS transmit *curus*; but since *agilis* would more comfortably agree with Bentley's *currus*, this emendation should be accepted.

199. metas : the image of turning posts in the Sun's course is Lucretian: cf. *Lucr.* 5.690f. *distinet aequato caelum discrimine metas | propter signiferi posituram totius orbis* (recall that the ecliptic and the zodiac (*signifer orbis*) trace the same course through the sky).

200. luna et stellae volitent : the Moon and planets can be said to 'flit about' in that their movements, though regular, do not directly match that of the sphere of fixed stars (196f.) and are rather harder to predict. On account of this movement, Goold (ad loc.) is right to identify *stellae* more specifically as the planets.

volitent has a Lucretian flavour, occurring 12 times in *DRN*, and three times in this very form.

per inania mundi : see 154 n.

201. pependit : in poetic Latin, the perfect is sometimes used in place of the present to express a truth founded in experience (see K-S 2.1 § 33.9), a usage which no doubt developed under the influence of the Greek gnomic aorist. Given this passage's focus on

perceptual evidence, its use here is particularly fitting.

202-205. In one sentence, Manilius concludes his discussion of the earth's position and moves on to the topic of its shape. The transition, mid-sentence, between these two subjects may strike us as abrupt, but any reader familiar with the Presocratic opinions on the subject would recognise an intimate connection between the two; for Anaximenes, Anaxagoras and Democritus attributed the earth's suspension to its supposedly *flat* shape (hence 204), basing their belief on the resistance air gives to flat objects (see Arist. *Cael.* 294b13-31 with Lloyd 1996, 317f.). The force of the lines then is this: the earth retains its central position even though it is not flat but round.

202. igitur : a characteristically Lucretian conclusion-marker (114 times in *DRN*, versus 81 in all of Ovid, 12 in Manilius and 3 in Virgil).

sortita : the participle occurs more often in Manilius than any other poet, with 9 uses. One possibly influential use is Germ. 138 *hunc caeli sortita locum*; but the word's connotations of destiny will naturally have appealed to an astrological poet.

202f. mediam...cavernam | aeris : the metaphor of the *caeli cavernae* is a staple of Latin verse from Ennius (trag. fr. 112) onwards (see e.g. Cic. *Arat.* 250-252, *De cons. suo* fr. 6 Büchner; Lucr 4.168-173, 391-393). For an in-depth study see Landolfi 1992.

204. patulas distenta plagas : 'stretched out into flat plains'.

condita : in its literal sense ('put together') the very opposite of *distenta*, setting the two

alternatives in vivid contrast.

205. *surgentem pariter pariterque cadentem* : as at 192f., the chiasmus mirrors the earth's symmetrical, sloping contour.

206-214. *First argument for the earth's roundness.* As at 194-201, Manilius invokes the analogy of the other, visible bodies: since the universe itself and the other celestial bodies are round, the earth too must be round.

The argument has an important parallel at Cic. *ND* 2.116: according to the Stoic Balbus, if the universe is round then so is the earth. While that argument also appears to be one from analogy, it is really based on physical laws: with a spherical earth, all matter forms a perfect equilibrium in its attraction towards the centre; and so, with no imbalance to threaten it, the earth's structure remains stable. Manilius has already included this argument in his cosmology (168-170), and almost certainly has it in mind here too. Here, however, Manilius is forced to replace its theoretical basis with one reliant on our observations, to match the aims of the passage (see 173-246n.).

He cannot, however, resist adding one theoretical detail to an otherwise observation-based set of arguments: delighting in the geometrical uniformity of the sphere (212f.), he calls it the shape 'most like the gods' (211). This claim, which is derived from Platonic and Stoic theory, plays a crucial role in his argument from analogy. According to Plat. *Tim.* 40A-C, the demiurge made beings of the divine class perfectly spherical, 'likening them to the All' (40A). This class is said to include the earth and planets (40C) as well as the celestial sphere and fixed stars (40A). Comparably, much is made in Cic.

ND of the Stoics' belief in a spherical universe and, God and the universe being one, a spherical God (1,18, 24; 2.46). Moreover, Cicero elsewhere makes it clear that a Stoic could speak of the celestial bodies and the earth as gods *plural* (Cic. *Acad.* 2.119; see also Mann 2011). Manilius's reasoning, then, is straightforward: we can see from observing the heavens that gods are round; the earth too is a god; therefore the earth is round. (A similar claim appears to feature in the tradition of astronomical manuals: cf. Ach. 7 ὥσπερ ἀπὸ κέντρον κύκλος γίνεται, οὕτω καὶ ἀπὸ τῆς γῆς εἶκος ἔξω περιφέρειαν γεγόνει.)

On any reading, the argument requires a greater deal of inference and theoretical assumption than Manilius allows himself in his other cosmological arguments. Nor is it obviously necessary, since the following argument alone (215-220) would suffice to prove the earth's roundness. I suspect that the reason for its inclusion is to provide a further anti-Epicurean taunt to an already hostile discussion of the earth's shape. For as Cicero makes clear, the idea not just of a round universe but – even worse – of a round *god* was particularly distasteful to an Epicurean (*ND* 2.46-8; cf. 1.18, 24); and so by subscribing to both beliefs, Manilius casts himself even more strongly as an anti-Lucretius.

206. naturae facies : the basic shape of the universe (for *natura* = *mundus*, cf. 118 with n.), expressed in a way that continues the recurrent personification of *natura* (see 188n.).

207. in convexa volans : Manilius shows a certain fondness for expressing movement and spatial relationship using *in* with a substantive neuter adjective. Expanding, perhaps, upon the established set phrase *in diversa* (1.275), his repertoire includes *in adversum* (1.684, 4.323), *in contraria* (2.165), *in seducta* (2.387), *in transversum* (2.573), *in perversum*

(2.891), *in pronum* (3.372), *in proprium* (4.703), *in obliquum* (5.80; cf. 1.687 *per obliquum*).

convexa : the first in a long and varied sequence of terms conveying the idea of roundness. At 173-201 Manilius highlighted the central details of his proofs through repetition of key terms (*pendeo, idem*); here he achieves the same effect through showy variation, employing 12 different expressions of roundness over the 29 lines of argument: *convexus, teres, orbis, rotundus, tumidus, globus, os, glomeratus, tumor, glomeramen, venter, gyrus*. The term *convexus* is first used in relation to the heavens at Cic. Arat. 314, but later becomes a distinctly Virgilian means of referring to the sky (e.g. Verg. *E.* 4.50; *A.* 1.608, 4.451, 7.543).

teretis...figuras : ‘the round shapes (of the stars)’. Here Manilius is alluding to a Stoic belief, found at Cic. *ND* 2.117, that the stars in their courses owe their spherical shape to their onward motion (*suo nisu conglobata*).¹¹ The choice of *teres*, literally ‘worn to a smooth roundness’, adds a whimsical touch, suggesting that the roundness is caused by friction between the rotating universe and its (non-existent) exterior. More likely an allusion to Emped. fr. 40/A49a Inwood.

facit esse : i.e. *facit ut sint*. K-S 2.ii p. 235 calls this construction vulgar, but it has good poetic authority: cf. Catull. 97.9 *hic futuit multas et se facit esse uenustum*, Lucr. 3.878 *facit esse sui quiddam super inscius ipse*.

¹¹ Note that the Loeb mistranslates *nisu suo* as ‘by their own internal gravitation’; the true sense, however, is recognised by the editors of *OLD* (see s.v. *nisus* 3).

208-10. Simple observation confirms that the Sun and Moon are both *rotundus*, but for Manilius's analogy to work, we must believe that they do not just have a circular face, but are actually spherical. Manilius therefore guides our attention to the nature of the Moon's illumination: if its visible circle were flat, we would only ever see either all or none of its face illuminated at any one time. But in fact, when we observe the Moon – at least, during most of its phases – we can see that it receives the Sun's light 'with a swollen body' (*tumido...corpore*). In other words, the curved boundary between light and shadow on its surface shows that the Moon is round in all three dimensions.

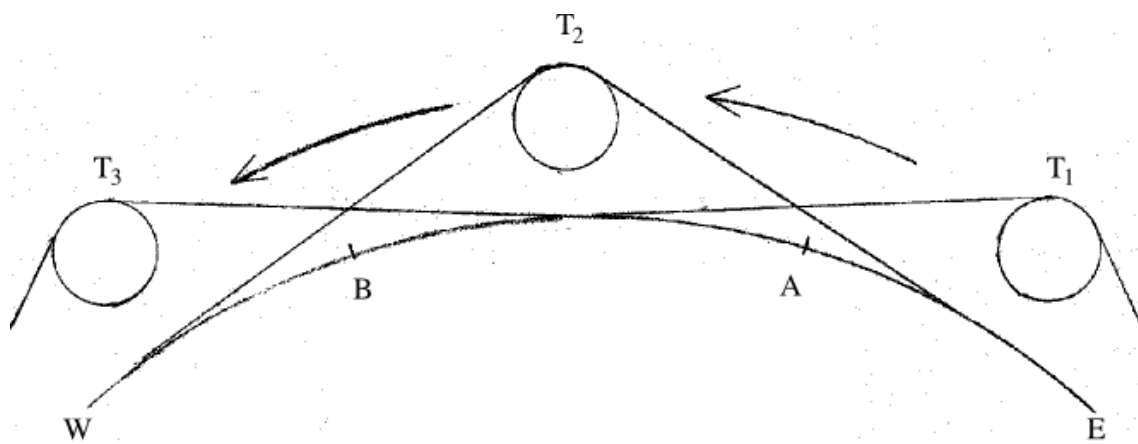


Diagram 1. The changing visibility of the Moon reveals the earth's roundness. At T_1 the Moon is visible at A but not B; later, at T_2 it is visible from both locations; later again, at T_3 , it is visible at B but not A.

209. *aspicimus* : the first of seven 1pl. forms in Manilius's treatment of sphericity, and the first in the poem. Both *aspicimus* and *conspicimus* (216) reflect the passage's concern for empirical evidence, but also create a fiction of shared activity between the poem's teacher- and the student-figures. This technique is used on three further occasions (495-7,

2.483, 4.876-895), and in each case a simple observation is used as the basis for a much more striking claim.

tumido quaerentis corpore lumen: to identify a sexual metaphor here (with Feraboli-Scarcia *ad loc.*) may be a step too far; but at any rate, the image of the Moon actively *seeking* the light sets the stage for the extensive personification to come (221-229).

210. obliquos...ignes : outside certain lunar phases, the Sun's rays may be called 'oblique', insofar as they appear to strike the Moon side-on, resulting in only a partial illumination of its face.

211. aeterna...divisque simillima forma: the sphere is 'most like the gods' in that the spherical universe and heavenly bodies are, at least for a Stoic, gods (see 206-214n.). The reason (explained at Cic. *Acad.* 2.119) is that a divine force permeates them all: *erit ei [sc. Stoico] persuasum etiam solem lunam stellas omnes terram mare deos esse, quod quaedam animalis intellegentia per omnia ea permanet et transeat.* (This, of course, is the divine force to which Manilius will introduce us at 247-254.)

manet : the cosmological discussion in Cic. *ND* 2 lays much emphasis on the long-lasting nature of the cosmic structure (2.85 *aut sempiterna...aut certe perdiuturna*) and its dependence on a spherical earth and universe (2.116). Manilius had touched lightly upon the issue at 168-170, and reaffirms this dependence here through repetition of *manet* (211, 214; see 213n.). Had he simply wanted to assert the earth's roundness, weaker verbs

would have sufficed; but *manet* implies the further claim that the earth's shape is unchanging.

212f. The sphere has no beginning or end (that is, no edges or vertices), but is equally round all over. These lines expand poetically upon one aspect of spheres and circles as characterised by Cicero: *omnes earum partes sint inter se simillimae* (ND 2.47). The other aspect, that all points on its edge are equidistant from its centre, has already been played upon (168-170, 203). While Manilius's following two arguments will adequately prove the *roundness* of the earth, these lines encourage us to believe that the earth is, more specifically, *spherical*. Though not strictly observational, they serve to align this empirical part of Manilius's cosmology with his earlier claim that the earth's stability depends on its perfect sphericity (168-170; see 211n.).

213. toto ore sibi : the MSS give *toto remanet*, which Bentley recognised as a false metanalysis from an earlier *toto ore manet*. It is tempting to retain *manet* here, on account of its emphatic repetition at 211 and 214; but here the word is less suitable: Manilius is speaking generally about the sphere as an abstract shape, not about the earth. Instead, we should follow Bentley in emending *manet* to a reflexive pronoun *sibi*, leaving *est* to serve as the verb for both of the line's conjuncts. This emendation is well defended by Goold (*ad loc.*), but gains added confirmation from a parallel – if not model – hitherto ignored: Cic. ND 2.47 *omnes earum partes sint inter se simillimae* (see 212f. n.).

ore is emended unnecessarily to *orbe* by Pingré, Housman and Flores. The extension of the sense of *os* from 'face' to 'surface' is typical of Manilius's experimental diction here,

reflecting his keenness to use a range of expressions for roundness (see 207n.) and involve body-part metaphor (cf. 219 *tractus laterum*, 232f. *orbem ventris*).

214. mundumque figurat : Jacob's emendation from MSS *mundumque figurant*, though accepted by most editors, requires a sense of *figuro* that is otherwise unattested ('reflect the shape of', *vel sim.*) Van Wageningen in his 1915 Teubner offers a better alternative, *mundique figura*, with both *figura* and *tellus* as subjects of *manet*. This latter has received no later endorsement, not even from that editor himself, who does not even mention it in his 1921 commentary. I suspect that later editors objected to the idea of a *glomerata figura*; but taken as a metonymy for the universe itself, the expression is actually very suitable, given Manilius's conception of the universe as a mass of matter that has formed itself into a ball (149-170).

167. There is no reason (despite Goold and Housman) to place this line, which plainly belongs in a discussion of the earth's centrality, at the end of an argument for sphericity, especially since that argument is adequately concluded at 214. To do so, in fact, makes nonsense of *idcirco* (215). It is better to place 167 after 159 (see [167] n. above).

215-220. *Second argument for the earth's roundness:* the earth's roundness accounts for the invisibility of certain stars in certain locations. Several ancient authors, beginning with Aristotle (*Cael.* 297b-298a), give this phenomenon as proof of the earth's sphericity. Manilius, like many authorities, cites the example of Canopus, which is visible only from southernmost latitudes of the Greco-Roman world.

Once again, Manilius uses several chiasmic arrangements to imitate and draw our attention to the earth's symmetrical contour (cf. 192f., 205). These range from the simple (215 *terris,..omnibus omnia signa*) to the more subtle (218-220: main clause, relative clause; relative clause, main clause).

215. idcirco : see 168n. For rhetorical variety, Manilius reverses the usual formulation of the argument, presenting its premiss (not all stars are visible everywhere) as the causal result of its conclusion (the earth is round). Cf. 230-234.

216. conspicimus : see 209n.

Canopon : as the second brightest known star after Sirius, it is no surprise that Canopus (α Carinis) became the stock example for this argument. As Geminus correctly observes, Canopus is just about visible from Rhodes, but can be seen more clearly from Alexandria (Gem. 3.15; so also schol. Arat. 351). Confusion over the exact location began with Eudoxus, who says it is visible from Egypt but not from Greece, an error corrected by Hipparchus (1.11.6-8 *θεωρεῖται ἐν τοῖς περὶ τὴν Ῥόδον τόποις*). The confusion continued into the early Empire, with Vitruvius giving Egypt (9.4.5) and Pliny giving Rhodes (*NH* 2.178) as the point from which Canopus is first visible.

217. donec ad Heliacas per pontum veneris oras : the text here is corrupt. For the paradosis we reconstruct *donec adeiacas per pontum veneris oras*, supplemented by a gloss or correction *ad nili(a)cas* for the garbled *adeiacas*. The likeliest source of the corruption

is an unusual proper name, since such words are especially liable to be garbled by scribes here (MN *adeiacas*) or banalised (hence GL² *niliacas*, a form found at 4.627). Housman's conjecture *Heliacas*, a Greek adjective relating to a prominent Rhodian family, is too brave: the adjective is not found in Latin, and geographical references elsewhere in Manilius are far less subtle. Flores' *Niliacas* has the disadvantage of assuming that Manilius would use a bare local accusative with a verb of motion, something he generally avoids. The best emendation, offered by Abry, has escaped the eye of most critics owing to its consignment to a footnote (Abry 2005, 254 n. 9): *ad Isiacas* for MSS *adeiacas* is almost certainly right: the same adjective ('pertaining to Isis', and hence to Egypt generally) occurs with in same sense and metrical position at 1.918. That Manilius identifies Egypt and not Rhodes as the first point of visibility is no ground for objection, as other sources agree with Manilius on the issue (see 216n.). Besides, Manilius may even have *chosen* the former for the sake of a pun: as Henderson notes, the best place to observe Canopus from is surely its namesake Canopus, on the Nile delta (Henderson 2011, 73f.).

218. sed quaerunt Helicen quibus ille supervenit ignis : Manilius is often held in error here, for both in Rhodes and much of Egypt, Helice (Ursa Major) remains visible throughout the night. Such critics wrongly assume the subject of *quaerunt* to be the inhabitants of the land named in 217; but this cannot be the case. As van Wageningen notes, *supervenit* ('looms above') suggests the star (Canopus) rises high in the sky, rather than just above the horizon. In all places where this occurs, especially those that can properly be called *laterum tractus* (219), Ursa Major will be invisible for part of the night

(hence *quaerunt*).

Helicen : this Greek name for the Great Bear is widely used among Latin authors from Cicero onwards, and for obvious metrical reasons held greater appeal to the poets than the native name *Semprtriones*. The origin of the Greek name may lie in the Bear's constant rotation about the pole (so Kidd 1997, 188).

219f. Manilius's cosmology is generally full of personification, particularly of the universe, its creative forces and the planets, but only here does the earth receive a similar treatment. With its swollen bulge (*tumore*) it snatches away (*eripiunt*) the sky from those who dwell on its flanks (*laterum*) and restricts their view (*visusque coercent*). By presenting the earth here as an active controlling force, Manilius reminds us that (in his present manner of speaking) it too is a 'god' (see 206-214n.).

220. terrae : since *tumore* is plainly an instrumental ablative, it makes more sense to interpret *terrae* as the earth as a whole (*OLD*) rather than certain 'lands' (Goold).

221-234. *Third argument for the earth's roundness: the evidence of the Moon.* This argument is at first sight rather problematic and has been the object of much controversy. This, as we shall see, is mostly due to Manilius's deliberately misleading imagery and diction. The root of the difficulty is the verb *deficere*, which I leave untranslated in the following paraphrase: when the Moon is immersed in dark shadows and *deficit*, the effect is not noticed simultaneously the world over, but first in the east and later in the west. If

the world were flat, it would rise and *deficere* at the same time the world over; but since it is round, the Moon appears in some places earlier than in others, and its rising in one place is simultaneous with its setting somewhere else.

Most scholars have taken the argument to concern lunar eclipses, and there is certainly much to encourage that reading: in astronomical contexts, *deficere* typically occurs in a technical sense, ‘to undergo eclipse’.¹² Also, Manilius’s western observers respond to the event with the clashing of bronze, a ritual normally associated with lunar eclipses (see 227n.). There are, however, some serious obstacles to the reading. The first is factual: lunar eclipses were recognised as evidence for the earth’s roundness, but not for the reason Manilius gives.¹³ In fact, since a lunar eclipse is caused by the earth casting its shadow over the Moon, it cannot (as we would have Manilius claim) be perceived at different times in different places, but occurs simultaneously the world over. I cannot, however, join the majority of scholars in believing Manilius capable of such an error: for elsewhere (4.841-52), Manilius demonstrates enough understanding of lunar eclipses to know that the phenomenon does not depend on an observer’s position: when the Moon passes into the earth’s shadow, there can be no point on the earth from which it still appears to be shining as normal. Secondly, and more importantly, a contrast is drawn at 228f. between the Moon as it rises (*orta*) and when it *deficit*. This contrast makes most sense if we assume that *deficere* does not have its technical astronomical sense here, but one of its more general meanings ‘to fail, fade, die out’ or ‘subside, sink’. For the Moon this could mean its disappearing from view (i.e. its setting), a perfectly suitable occasion

12 The *OLD* lists as a related sense ‘to wane’ leading Henderson to suggest that Manilius’s proof concerns not eclipses but lunar phases (Henderson 2011, 70-73).

13 Aristotle (*Cael.* 297b 23-30) correctly observes that as the Moon enters an eclipse, the shadow that the earth casts on it is clearly seen to be round, proving that the earth itself is round.

for the verb's use; and in fact this interpretation gains some confirmation at 230-232 (see n.).

This reading saves Manilius from error, since the setting of the Moon *does* move gradually westward, an effect caused by the earth's curvature. However, it raises a serious question. Why involve the misleading language and imagery of eclipses? I suspect that its purpose may be to offer some humorous misdirection for the entertainment of more learned readers. They may know from Aristotle how a lunar eclipse reveals the earth's shape, and having read 221f. may be expecting Manilius to offer this proof here. When instead he delivers the (apparent) howler that the moon *deficit* first in the east, they are poised to accuse him of error; but then, in a surprise move, he reveals that eclipses were not the subject after all, but the more regular *defectus* at moon-set (228-234). Manilius will use a similar *paraprosdokian* at 236-246 (see n.).

There remains a serious and long-unsolved problem:¹⁴ if Manilius's argument boils down to one about local differences in time-zones or risings and settings, why does he concentrate specifically on the Moon? Humour may once more be the motive: though any object that can be seen to rise and set could be used to prove the same point, the Moon is the only one, both in reality and according to ancient calculations, that was close enough to the earth for the latter's roundness to be clearly visible (so, later, Cleom 1.8). To a star, the Sun or the planets, the earth would appear little more than a speck. We thus have the amusing scenario of the earth seeking confirmation of its roundness from the only other body capable of seeing and attesting to it.

¹⁴ It is essentially the problem raised by Malchin 1893, 17, and with which all of Manilius's commentators have struggled.

221. te testem dat, luna : though not a common formula, *testem dare* ('present as a witness') occurs most often in legal contexts (e.g. Cic. *Verr.* 4.100, Liv. 37.45.12). The legal association suggests the humorous image of the earth standing trial on a charge of being flat.

glomeraminis : apparently a Lucretian coinage, *glomeramen* is found outside the *DRN* only here and at Man. 4.519.

222. mersa nigris...umbris : a possible hint that Manilius is talking about the Moon's setting and not eclipses. During eclipse, the Moon is generally not invisible (as these words would suggest; so also Plin. *NH* 2.43) but only darkened somewhat and reddish-brown in colour. Only during the darkest eclipses (those with a value of L0 on the Danjon Scale) is the Moon nearly invisible, and then only at mid-totality.

per noctem : a Virgilian expression (five times), typically understood as meaning 'throughout the night'. It is possible that Manilius has in mind those nights on which the Moon is not seen to rise at all, having set around dusk. However, the likelier sense here may be '(at some time) during the night' (*per* s.v. *OLD* 6), given that the following lines appear to describe the event of the Moon's disappearance, which would not be perceived if it were to set alongside the much brighter Sun.

deficis : 'you fail', i.e. 'your light fails'. This general intransitive sense is to be preferred over a technical one ('suffer eclipse', 'wane'): see 221-234n.

223. confundis sidere : lit. ‘you set them in disorder with your planet’. We now learn that the Moon is actively responsible for her own disappearance, making the parodied bronze-clashers look all the more ignorant for trying to assist her in her plight (see 227n.)

225. post medio subiecta polo quaecumque coluntur : Bentley deletes the line, arguing that n. pl. *subiecta* should agree with *terrae*. While the substantival n. pl. is unusual, I suspect it is intended to give more variation to the three-part division of the earth. Hence we have eastern *lands*, western *peoples*, and *whatever habitations* are located beneath the sky’s middle.

medio subiecta polo : Manilius follows Virgil in using *polus* principally to denote the sky (only at 5.693 does it denote just the pole). Here, *medio...polo* derives its meaning from its context: it is the part of the sky that lies above the space between the eastern lands of 224 and the western peoples of 227.

225. 227. post...seraque : the sequence may be inspired by Germ. 120-122 *at postquam argenti crevit deformior aetas | rarius invisit maculatas fraudibus urbes | seraque* (sc. Iustitia) *ab excelsis descendens montibus* (cf. also Verg. A. 523f. *post... | seraque...omina*).

[226.] Deleted by Bentley and most later editors, the line is too close in sense to 227 for both to sit well together, even after Housman’s emendations. It is hard to believe that an interpolator could have seen a need to supplement the sense of 227, let alone with a line

so similar. I am inclined, therefore, to see 226f. as authorial variants, one of which would ideally have been excised before publication.

227. quatiuntur...aera : the clashing of bronze cymbals was a traditional apotropaic response to eclipses, designed to assist the Moon in her 'plight' (usually expressed in Latin by *labor* and its cognates). Over time this magical ritual, closely related with that of drawing down the Moon, attained the value of a poetic topos (see Ov. *Met.* 4.331-3, 7.207f.; Gow 1952 *ad Theoc.* 2.36, Enk 1946 *ad Prop.* 1.1.19, Courtney 1980 *ad Juv.* 6.551-3). The practice was still alive in Manilius's day: for a near-contemporary example see Tac. *Ann.* 1.28.

hesperiis : Goold's emendation offers no advantage over MSS *extremis*, which is a wholly adequate reading. Goold conceived the emendation at a time when he believed 225 to be an interpolation (Goold 1959, 101), leaving *eoae* (224) and *extremis* in adjacent lines and placing them in an unsuitable contrast. If we accept 225, however, the progression of ideas (*eoae...medio...extremis*) is entirely unproblematic and leaves no need for emendation.

228-232. These two sentences are clearly presented as a contrast, both by their construction (*quod si...sed quia...*) and in their sense: if the world were flat, the Moon would first rise and later *deficere* in all places at the same time (228f.); but since the world is round (230), the Moon appears first to some lands then to others, always rising and setting at once (231f.). The only way to make sense of the contrast is to take the opposing verbs *apparere/exoriri* and *cadere* at 231f. as a variation on the *oriri* and *deficere* at 227f.;

that is, to take *apparere*, *exoriri* and *oriri* as synonyms (as indeed they are), and to take *deficere* as equivalent in sense to *cadere*. Any other reading makes nonsense of the opposition. We are left in no doubt, therefore, that *deficere* in this passage means not ‘suffer eclipse’ or even ‘wane’, but ‘set’.

228. quod si plana foret tellus : on the argument-form see 173-181n. A strikingly similar phrase and argument occurs at Plin. *NH* 2.180, a passage describing the local visibility of *solar* eclipses, which actually does move from east to west: *quod si plana esset terra, simul omnia* (i.e. celestial phenomena) *adparerent cunctis*. It seems that Pliny (like many modern scholars) read these lines as pertaining to eclipses and rehabilitated them, as it were, in the more suitable context of a solar eclipse.¹⁵

229. miserabilis : from the focal point of the bronze-clashers, who attempt to come to the rescue of the disappearing moon (see 227n.).

230. per teretem...tumorem : *per* is often used, as here, to describe a course along or over a linear object (*OLD* 2).

deducta est : ‘is drawn out, made to extend outwards’ (*OLD* 3b, used both of lines and structures). This figurative, linear sense recurs at 279, 457.

231. his modo, post illis...terris : a careful variation on his earlier description of the

¹⁵ Note that Pliny, like Manilius, follows these observations with a chapter on the regional differences of night and day (2.181).

Sun's changing position (191 *nunc his nunc illis...regionibus*).

Delia : Diana, the Delos-born goddess of the Moon, is here identified *as* the Moon, probably by analogy with the traditional identification of her brother Phoebus as the Sun. A precedent may be found in Horace (*Ep.* 5.51 *Nox et Diana, quae selementium regis*), but Manilius is the first author to refer extensively to the Moon as Diana (1.669, 2.95, 4.844, 5.3, 5.721, all as *Delia*). His motive was probably a desire for variety, since in all but one case the word *luna* is found close by.

232. exoriens simul atque cadens : a pun, as Henderson observes, on *simulatque* 'and pretends' (Henderson 2011, 72). The pun is fitting for a passage aiming to show that the Moon, being in constant orbit around the earth, cannot properly be said to rise and fall (set).

232f. fertur in orbem...ventris : 'is carried along a bellying orbit' (Goold), an unusual and slightly awkward periphrasis whose presence is better seen as an attempt at varied expression (see 207n.) than a desire for personification.

233. acclivis pariter declivia iungit : 'joins its downward slopes to its upward slopes equally'. Here we have another case of etymological wordplay (see 173n.), in the pairing of *acclivis* (n. dat. pl. of *acclivus*) with *declivia* (n. acc. pl. of *declivis*).

234. gyros : perhaps unsurprisingly, Manilius uses *gyrus* more than any earlier author (19

times, of which 17 are in Book 1). His usage covers a number of senses, always denoting some sort of round, imaginary line. Here the likeliest referent is the horizon (so Goold), one of the five celestial *gyri* (539-804), and one which changes along with the observer's latitude (648-662), hence the plural here.

[235.] As Bentley observed, the line turns a logically unproblematic set of claims into a circular argument ('Because the earth is round, the Moon rises and sets in different places at different times. *Therefore the earth is round*'). It is just about possible that *hanc* (236) could pick up *terrarum forma*, although the metonymy is awkward and we would really expect the pronoun and concrete noun to agree in number. To these points we may add the line's redundancy: it has been obvious throughout that the earth's roundness is the object of proof. Nor, besides, do any of the other arguments in this part of the book conclude with such a summary. We would do best, then, to treat the line as an interpolation (despite Abry 2005 and Henderson 2011), most likely added by someone who was unable to see a feminine noun to which *hanc* could refer (236).

236-246. *The antipodes.* Manilius concludes his discussion of the earth's spherical shape by considering its implications for those living at the opposite point on the sphere: they, like us, will believe themselves to be 'on top' of the earth, and their hours of day and night will be the reverse of ours. Scholars have invariably found fault with the latter assertion, taking it as a claim that time-zones change according to latitude rather than longitude.¹⁶

16 At 637-647 Manilius leaves us in no doubt that he understands the true nature of time-zones (that they are determined by longitude and not latitude). Volk's explanation, that Manilius is deliberately in error here to align himself with Virgil, is ingenious (Volk 2011, 109f.); but there is in fact no reason to see any error in Manilius's claims, and it makes better sense to see them as a poetic *correction* of Virgil's error (see 239n.).

This, however, is a misreading: Manilius is in fact referring to those who live *sub pedibus...nostris*, i.e. diametrically opposite to us (see 239n.). These people, the antipodes proper, must therefore dwell in the eastern as well as the southern hemisphere:¹⁷ hence their hours of night and day *are*, as Manilius correctly claims, the reverse of ours.¹⁸

Discussion of the antipodes and the various other habitable parts of the earth was a standard feature of astronomical handbooks (see Geminus 16, Achilles 30, Cleomedes 1.1). In a part of the poem that owes a good deal to that tradition, the inspiration for these lines is likely to have come from such texts. Equally importantly, the subject allows Manilius to pay homage to two descriptions of the southern hemisphere in earlier verse (Lucretian passage is a hostile parody of the belief in the upside-down world of the antipodes; and so, by subscribing to just that belief, Manilius opposes himself all the more conspicuously to his Epicurean predecessor. The Virgilian passage, on the other hand, with its misunderstanding of the southern hemisphere, provides an opportunity for poetic correction (see 239n.).

17 On the terminology and relevant divisions of the earth's sphere, see Moretti 1994, 241-246.

18 So Ach. 30: οἱ δὲ ἀντίχθονες τὰς νύκτας καὶ τὰς ἡμέρας παρηλλαγμένας ἔχουσιν· τοῖς γὰρ ὑπὲρ γῆν ἀνατέλλων ὁ ἥλιος ἀντίχθουσιν ἡμέραν ποιεῖ, τοῖς δὲ ὑπὸ γῆν νύκτα.

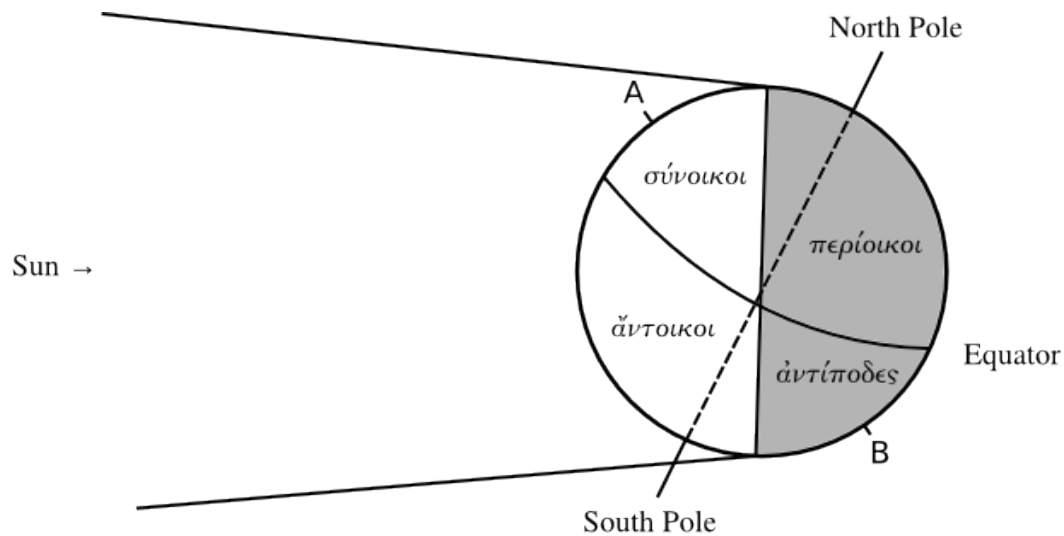


Diagram 2. When it is day at A, it will be night in the diametrically opposite position B, and *vice versa*. The Greek text gives the names used by Geminus and Cleomedes to refer to the inhabitants of each quarter-sphere.

236f. There seems to have been a certain amount of debate concerning whether the other temperate parts of the earth were actually inhabited, or whether they were just habitable. Eratosthenes argued that if the world is spherical, it must be inhabited all the way round, a view cited and apparently endorsed by Strabo (1.4.1). Geminus, on the other hand, is more reserved: he accepts that the earth's sphericity demands another temperate zone on the southern side of the torrid (i.e. equatorial) band, but points out that we have no evidence of human life there (16.19f.). By positively asserting the existence of human and animal life all around the world (236f.), Manilius aligns himself on this question with Eratosthenes.

236. hanc circum : as Housman points out, *hanc* must pick up *terra* (230) and not *Delia* (232). The large portion of intervening text and the potential ambiguity of the referent may explain why the interpolator of 235 felt the need to supply a feminine noun closer at

hand (see 235n.).

variae gentes hominum atque ferarum : an expression of Lucretian character, probably inspired by *Lucretius* 2.1076 *varias hominum gentis et saecla ferarum*. Both passages asks us to believe in other worlds (or in Manilius's case, parts of the world) that are populated, like ours, by various races of men and beasts.

237. eius : the first of 15 instances of *eius* in Manilius As Butterfield has shown, Manilius eschews the trend among Augustan poets to avoid *eius*, and follows the less fastidious precedent of Lucretius (Butterfield 2008).

239. sub pedibusque...nostris : this phrase equates in sense to Geminus' κατὰ διάμετρον ἡμῶν (from his passage on the antipodes, 16.20), and brings to mind the obvious derivation of the name (ἀντί-ποδες 'those with feet opposite'). As various sources show, it was natural for someone familiar with the ancient model of the earth (and the forces that keep it together) to conceptualise the 'people underneath our feet' as those diametrically opposite. Modern world maps make it tempting to conceive of the people underneath our feet as those on the same longitude but in the opposite hemisphere (which may account for previous scholars' misinterpretations of this passage). Ancient authors, however show better geometrical sense: Cicero is well aware that the antipodes occupy only half – the eastern half – of the southern hemisphere (*Acad.* 2.123, cf. *Somn. Scip.* 12f.), as, of course, is Geminus and the later astronomical authors (Cleom. 1.1, Achilles 30, *Macr. Somn. Scip.*).

Virgil provides a more problematic case. At *G.* 1.242-251 he cites two opinions on what lies at the southern pole: either there is perpetual night, or day and night there are the reverse of ours. The second opinion would be correct if Virgil were discussing what lies precisely *sub pedibus* (243), but he is speaking more broadly than that: his claims concern the whole of the southern hemisphere, the part of the earth (*illic*, 247) from which the South Pole (*illum* (sc. *verticem*), 242) is visible. Manilius has clearly recognised Virgil's error in identifying the southern hemisphere with the land *sub pedibus* where everything is reversed, and has accordingly omitted this spurious identification from his passage on the antipodes. Seneca, who quotes from these Virgilian lines, makes a similar 'correction', rightly naming Virgil's upside-down, back-to-front folk as *antipodes* (*Ep.* 122.2), rather than as inhabitants of the southern hemisphere in general.

241. et pariter surgente via pariterque cadente : at 192f. and 205 Manilius used chiasmus to mimic the earth's contour; here he achieves the same effect through parallelism.

242-5. In contrast to Virgil's rather straightforward description of local time difference (*G.* 1.249-251), Manilius indulges in a touch of fancy, envisaging the citizens of this reversed world sleepily returning to their labours just as we are falling asleep.

244. operum vadimonia : 'the appointed round of work' (Goold). In its figurative sense, *vadimonium* denotes the keeping of an appointment (*OLD* 3). The word occurs twice elsewhere in Augustan verse (*Prop.* 4.2.57 *Ov. Am.* 1.12.23) and twice in Plautus (*Cur.*

162, *Epid.* 685).

245. somnosque in membra vocamus : Burman's emendation from MSS *locamus* is entirely convincing. Aside from the difficulty of the imagery, *locare* in this figurative sense (*OLD* 4) is usually followed by a preposition taking the ablative.

246. Manilius cites the common view that an intervening ocean sets north-western peoples apart from the antipodes (*utrosque...distinguit*), a fact that explains why the two groups have not encountered each other (Plin. *NH* 2.170, Cleom. 1.1.262-70; cf. *De mundo* 392b20, Macrobius *Comm. Somn. Scip.* 2.9.5). The same water, however, also 'binds them together' (*alligat*) in that it provides a continuum of matter between the two groups: hence both, though separate, are thought of as belonging to a single world.

distinguit et alligat : compare Manilius's later variations upon this pairing, *dividit et cingit* (306), *distingui claudique* (452).

247-254: The divine spirit that unifies and governs the universe

The cosmology now reaches its climax with the introduction of Manilius's God, a divine spirit that unites the varied matter of the cosmos as a single organic entity. This for Manilius is the most important aspect of his cosmology, one that will be repeated several times in the poem (2.60-81, 3.50-55, 4.886-893; cf. 1.483-5). The purpose of Manilius's cosmology is to persuade his reader that the possibility of astrology arises from physical

laws (see 118-246n.). Naturally, therefore, he must include some explanation of how the stars manage to determine (or at least reveal) events on earth. The usual explanation given elsewhere is that the heavenly bodies emit some sort of influence (*vis*) which affects us on impact (Cic. *Div.* 2.93f.). Manilius, on the other hand, offers an alternative explanation, borrowed from Stoic physical doctrine: he claims that all matter – the heavens, the earth, and everything in between – is interconnected, with the result that even the tiniest change in the celestial configuration has some corresponding change below on earth. If we accept this claim, we must conclude that, with sufficiently accurate and precise measurements and a large enough evidential basis, we can use heavenly observation to predict events on earth. We do not discover yet why this requires the involvement of a divinity: the reader must wait until the next book to learn that, for Manilius, the stability and integrity of the universe depends on the governance of a divine master (2.67-79).

As Lapidge has observed, these lines present a clear and accurate statement of Stoic doctrine, and are richly endowed with the imagery of Chrysippean physics (see Lapidge 1989, 1393f. and nn. below). As already mentioned, however, the reader is only given part of the picture. In each later restatement of the view, Manilius will add a further detail of the relevant Stoic theory: at 2.60-81 he expands upon God's governing role, explaining that the divine spirit is immanent in the world; at 3.50-55 we learn that God is identifiable not just with the divine spirit but also with Nature; finally at 4.886-893 we discover that the same relation of spirit to matter is found in man, the microcosm.

By concluding, as he began, with discussion on an elemental level (cf. 122-144), Manilius gives his cosmology a satisfying roundedness and sense of completion at its finish. The lesson on general physical principles draws to an end, and the student is ready

to begin a tour of the night sky in its finer details.

247. hōc opus immensi constructum corpore mundi : even before he has mentioned the interconnectedness of the elements (252-4), Manilius tailors his word-order to mimic this aspect of the cosmic structure. Here and, to a lesser degree, in 248, the reader must pause to ‘unpick’ the interwoven noun-phrases before he can make full sense of the syntax.

corpore : the fabric or framework of the universe (*OLD* 6), but also, more importantly, its ‘body’ as distinct from its soul (*OLD* 2): Manilius’s purpose in this passage is to contrast the universe’s matter with its governing spirit, and can thus do so in a way that continues the metaphor of cosmos-as-organism.

248. membraque : if the *corpus* (247) is the total of the universe’s matter, then the four elements can reasonably be called its *membra*. Notably, this very metaphor of the *membra mundi* has a precedent at Cic. *ND* 2.86, also in a passage discussing the divine governance of the cosmos. Only three lines before, moreover, Manilius had spoken of our human *membra*; the closeness encourages us to compare the constitution of the cosmos with that of man, prefiguring the explicit comparison of the two at 4.886-893.

249. aeris atque ignis, terrae pelagique iacentis : a more conventional instance of the poetic trope of a compact list of elements (cf. 137f. with n.), and very close in wording to Manilius’s two later examples (3.52, 4.889).

250f. sacroque meatu | conspirat deus : ‘God guarantees harmony by his sacred motion’, a highly allusive reference to the Stoic notion that God/the divine spirit extends throughout all the matter of the cosmos, a detail that is not otherwise introduced until 2.61f. The sudden change of subject and the obvious similarity between the works of the *vis animae divina* and the *deus* leave us in no doubt that they are one and the same thing.

conspirat : more learned readers would recognise this as a calque of the Chrysippean term *συμπνέω* (Lapidge 1989, 1394). The Latinisation may well be the work of Cicero, who uses it in the same technical sense at Cic. *ND* 2.19, 3.28). It is the sole indication so far that this *vis animae divina* is the Stoic *πνεῦμα*, to which Manilius has alluded once already (see 152n.).

252. mutuaque...foedera : the phrase recalls the *foedera naturai* (‘nature’s laws’) of Lucretius (1.584, 2.232, 5.310, 924, 6.906f.), and perhaps some related sense is intended here: God does not only ensure that the parts of the universe are interdependent and stable, but imposes upon them certain limits as to what is physically possible. Compare also Cic. *ND* 2.115 (from a passage of similar content): *maxime autem corpora inter se iuncta permanent cum quasi quodam vinculo circumdato colligantur*.

253f. Since we have been told that God governs *tacita ratione*, it makes more sense to read these lines as a consecutive rather than final clause (*contra* Goold).

253. altera ut alterius vires faciatque feratque: sc. *pars*. Here Manilius alludes again to the Stoic theory of elemental transformations (see 157f. 154n.)

255-371: THE NIGHT SKY – THE NORTHERN CONSTELLATIONS

255-262: Introduction

One brief sentence (255f.) announces Manilius's plan to relate the constellations that populate the night sky. The remainder of the passage introduces us to the zodiac, which, as the single most important agent in his astrological system, will have pride of place in the star catalogue (263-274). Manilius gives a succinct and accurate description of the zodiac: it is the line of constellations through which the Sun and planets move, and from which the entire plan of fate is deduced (see 261n.).

255f. The programmatic statement has several close analogues, giving it the air of a formula: 4.122f. *nunc tibi signorum mores...reddam*, 310 *nunc quae sint coniuncta* [sc. *signa*] *quibus quove ordine reddam*; cf. also 2.713, 5.174 *nunc...canam*, 5.486 *nunc...referam* (all similarly indicating a change of topic). The closest precedents and likely inspirations for these announcements are Lucr. 5.509 *motibus astrorum nunc quae sit causa canamus*, Verg. *G.* 2.2 *nunc te, Bacche, canam*.

255. lucentis undique flammis : cf. Arat. 19 ἄλλυδης ἄλλοι εἶόντες. Manilius intends his description to be exhaustive, which may account for the inclusion of hypothetical star-groups around the southern pole (see 443-455n.).

256. ordinibus certis : a further formulaic touch (see 59f. n). The plural reflects

Manilius's division of the constellations into three *ordines*, zodiacal (see 257), northern and southern.

referam : whether we read it as a future or a jussive subjunctive, the verb offers a more assertive expression of the poet's purpose than can be found in the Aratean tradition. Any reader expecting an *Aratea* from this part of the poem will be struck by Manilius's more authoritative proclamation and the absence of a divine invocation (contrast Arat. 17-20).

canentur : used to programmatic effect also at 2.965, 3.586 (both at line-end).

257-261. the first of the book's two concise and very different descriptions of the zodiac (the second, 667-680, is concerned more specifically with the ecliptic circle). Together they ensure that the student is familiar enough with the belt to understand the zodiac-based teaching of the following three books.

257. obliquo...ordine : the zodiacal circle lies at an angle of roughly 23° to the equator, and is therefore *obliquus* relative to the poles. It divides the universe nonetheless into two equal halves: hence its stars are *media* 'in (i.e. around) the middle'. Cf. Verg. *G.* 1.239 *obliquus...signorum...ordo* (where the ecliptic is *obliquus* with respect to the parallel circles).

praecingunt...mundum : 'gird the universe'. Used later of other celestial circles (576, 653, [664]), the verb locates the zodiacal constellations at the absolute outer limit of the

spherical universe, an important detail for Manilius's celestial geometry (see 539-560n.) as well as for the stability of the earth (168-170n.). The choice of verb prefigures the metaphor of the zodiac as the *balteus* ('girdle') of the universe (679, 3.334), the belt holding its two halves together.

258. solemque alternis vicibus per tempora portant : the signs take turns, month by month, to carry the Sun. Manilius surely has in mind Arat. 550f. Ἐν τοῖς ἡέλιος φέρεται
δουκαίδεκα πᾶσιν | πάντ' ἐνιαυτὸν ἄγων.

tempora : 'times of year, seasons'. Cf. Cic. Arat. fr. 33.333 (*sol*) *annua conficiens uertentia tempora cursu*.

259. atque alia aduerso luctantia sidera mundo : the planets are distinguished from the other *sidera* by their contrary motion (see 15n.). Manilius repeats the line almost verbatim at 670 (from the second passage on the zodiac) and 805. Cf. also 309.

alia...sidera : not another subject of *canentur* (256) but the object of *portant* (258). The following passage concerns only the signs of the zodiac, rather than its other, planetary, inhabitants.

aduerso luctantia...mundo : contrast *Epinomis* 987b, where the cosmos in its rotation is said to 'carry' the planets.

260. omnia quae possis...numerare : the relative clause is final, following *canentur* (256). Manilius will teach us the signs of the zodiac so that we may be able to count them on clear nights (something which cannot, of course, be done on a single night).

caelo...sereno : a common expression, also found at line-end with one intervening word at Lucr. 6.247, Verg. *A* 3.518, *G.* 1.1260, Ov. *Met.* 1.168, 2.321.

261. Goold (comm. ad loc.) and Schwarz 1972 rightly defend the line's authenticity: for while Housman (*ad loc.*) correctly observes that it is the entire *mundus*, and not just the zodiac, whose movements determine events on earth, Manilius's unique astrological system derives its predictive information from the zodiac alone. Manilius is therefore quite right to describe the zodiacal signs as those 'from which the entire plan of fate is deduced'.

262. 'So that very thing (i.e. the zodiac) may be first which contains the citadel of heaven'. The hyperbaton is awkward. Goold suggests that it is intended 'to achieve the balance so much beloved by the Roman poets whereby the adjective (or as here a dependent genitive) end the first half of the verse, the noun the second' (comm. ad loc.).

mundi...arcem : 'heaven's citadel'. Scholars have resisted this more specific reading (rather than, say, Goold's more general 'vault'). Taken more specifically, however, the image aptly prefigures the poem's closing simile, which likens heaven to a city-state, in which stars, like earthly citizens, differ according to rank and importance (5.734-745). It is fitting, then, that the *arx mundi* should be home to the most powerful luminaries in

Manilius's universe, the twelve zodiacal signs. For the expression, cf. *Ov. Am.* 3.10.12 *sideream mundi...arcem*.

263-274: The twelve signs of the zodiac

Twelve tightly woven lines introduce the twelve zodiacal signs. Beginning with Aries at the start of spring (see 263n.), Manilius leads us through them in order of their rising, returning finally to Aries (274) and thus completing the circle of the year.

Self-contained descriptions of the zodiac were a standard and constantly evolving feature of the Aratean tradition and came to be imitated in later works in other genres (most notably *Sen. Thy.* 850-868). The earliest zodiac, *Arat.* 554-559, is little more than a catalogue of Hesiodic type, but provided the raw material for the more elaborate versions of the translators. Cicero fleshes out his zodiac into twelve lines, with one line allotted to each constellation (*Cic. Arat. fr.* 33.320-331).¹ A second zodiac, attributed to his brother Quintus (*Q. Cic. fr.* 1.1-13),² turns the zodiac into a calendar, focusing on the weather typical of each month rather than the imagery associated with each constellation. Germanicus takes the trend of expansion even further, filling his zodiac-passage with mythological detail (*Germ.* 532-564).³ Manilius, however, pursues a different trend: recognising the mnemonic potential of Cicero's twelve-line zodiac, he uses run-on to produce a more easily memorised passage. With Cicero's largely self-contained lines the

1 For examples of other poems in which aspects of the form symbolically represent numbers of months and even days, see Courtney 1990.

2 On this fragment, its authorship and date, see Gee 2007 and Possanza 1992. Courtney 1993, 179 provides the best edition and commentary. We cannot be certain whether the fragment comes from a version of Aratus, but the four other surviving lines (17-20) reveal that the poem was at least of a similar character to the *Phaenomena*.

3 Germanicus' zodiac is so much changed, in fact, from the original that an interpolator felt the need to supply a brief and more faithfully Hesiodic list of the signs (565-567).

risk of wrongly remembering their order is fairly large.⁴ Manilius's lines, on the other hand, are almost entirely un-interchangeable, and therefore offer a helpful mnemonic to anyone wanting to memorise the order of the signs. Since the teachings of Manilius's later books require that level of familiarity with the signs, his provision of a memorable zodiac is especially provident. The strong visual focus of the passage makes an equal contribution to this goal. As in the description of the universe's structure (149-172: see n.), narrative is used to convey vividly the physical arrangement of something that would otherwise prove difficult for the reader to visualise. Manilius dispenses with the conceit of a teacher pointing out the constellations, sensibly, for few of the zodiacal constellations bear any resemblance to what they supposedly represent.⁵ Instead, the zodiac is described as it might appear on a celestial globe, providing an opportunity for vivid and yet accurate depiction. In fact, Manilius's zodiac corresponds in many details with the surviving globe of the Farnese Atlas (a Roman copy of a Hellenistic globe: see Appendix), suggesting he may be working from such a depiction. Nor does Manilius take the opportunity to relate the catasterism-myths associated with the signs: these he sets aside as a source of variety and relief from the more forbidding lessons of his later books.

4 *Contra* Possanza 2004, who correctly recognises the significance of a twelve-line passage, but wrongly sees self-contained lines as a mnemonic advantage.

5 Contrast the many deictics of Germ. 531-564.

Accessible accounts of the history and mythological associations of the twelve signs are offered in Feraboli-Scarcia (ad loc.) and Kidd 1997 (see index s.v. 'Aries' etc.). For more detailed discussion, see van der Waerden 1953 and Hübner 1982.

263. aurato...in vellere : cf. Germ. 532, Man. 2.212 *aurato vellere*. **Aries** (also *Laniger*, *Corniger*) is identified as the Golden Ram of Colchis, to whose myth Manilius frequently alludes (2.34, 4.514-517, 532, 744-752, 5.32-37). While Aratus gives no catasterism myth for Aries, Germanicus offers the same tale as Manilius (532-535) and is his likeliest inspiration.

princeps : the sign of Aries marks the beginning of spring and of the whole year, and so was seen as 'leader' of the signs (Man. 2.34, 456, 485, 945, 3.278, 4.331, 5.32), an appellation found as early as Nigidius (fr. 88 Swoboda: *ducem et principium signorum*). Aratus' zodiac, which begins with Cancer, pre-dates the identification of the spring equinox (coinciding with the first point of Aries) as the start of the year, and innovation attributed to Hipparchus (see Feraboli-Scarcia ad loc. and Kidd 1997 on Arat. 545).

fulgens : an exaggeration in keeping with the passage's generally hyperbolic language, and a more accurate description of Aries as represented on a contemporary model of the heavens than of the actual constellation, which Aratus rightly describes as feeble and starless (*νωθής καὶ ἀνάστερος*, 228).

264. respicit : like the Aries of the Farnese globe, Manilius's ram 'looks backwards' at Taurus (cf. 2.212).

admirans aversum surgere Taurum: a whimsical detail: Taurus' backward rising is a source of wonder to the Bull.

Taurum : identified by Manilius with the bull that bore Europa (2.489-491, 4.681-683).

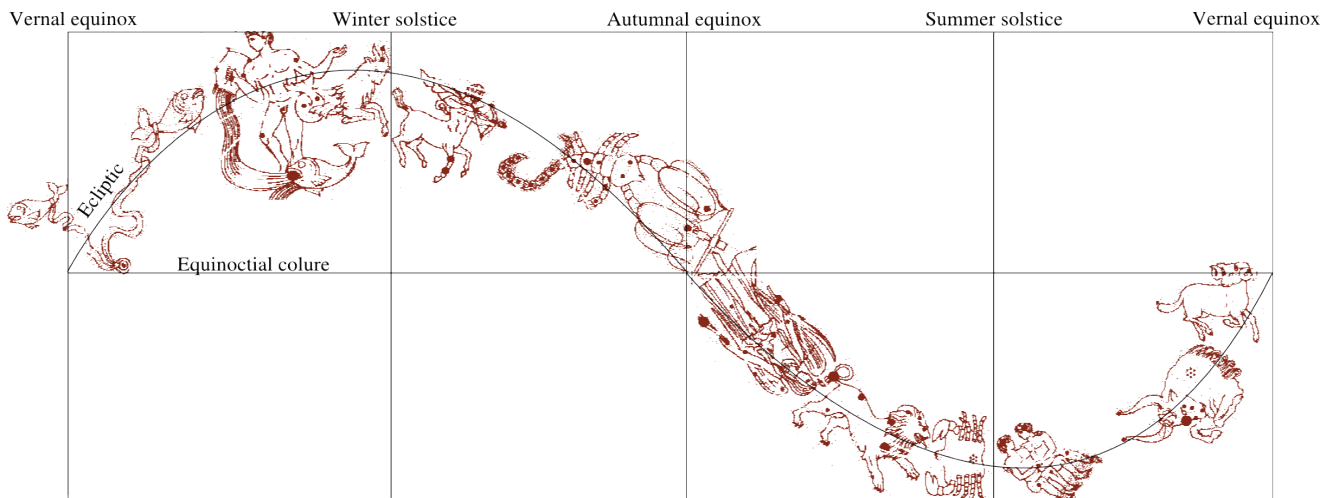
summisso vultu : 'lowered' (not 'raised'), another point of similarity with the iconography of the Farnese globe.

266. Virgo : perhaps following Verg. *G.* 1.33, Manilius frequently names Virgo as Erigone (daughter of Icarius), breaking with the Aratean tradition, which identifies her as Dike (Iustitia). He seems, however, to have conflated the two figures, calling Erigone the one 'who ruled ancient ages with justice' (4.542f.).

267. Cf. Verg. *G.* 1.208 *Libra die somnique pares ubi fecerit horas*, Cic. *Arat.* fr. 33.287f. *sol lumine verno | exaequat spatium lucis cum tempore noctis*. The autumnal equinox, to which the line alludes, occurs as the Sun is leaving the sign of Libra (see diagram).

Libra : originally known as the claws of the Scorpion (*Chelae*), the constellation came to be seen as the yoke of a balance (on the changing nomenclature see Possanza 1992 and Evans & Berggren 2006, 117, n. 12). Manilius nonetheless makes frequent use of the old

name, and uninhibitedly refers to the *iuga Chelarum* ('the yoke of the Claws', 611).



269f. Cf. Arat. 305f. Ἦτοι γὰρ μέγα τόξον ἀνέλκεται ἐγγύθι κέντρου (sc. Σκορπίου) | Τοξευτής.

270. mixtus equo : cf. 2.172 *iunctus equo*.

volucrem missurus iamque sagittam : 'and now on the point of shooting a winged arrow'. We should not supply *est* here (with Housman): since Manilius is describing a state and not an imminent event, the participle is best treated as merely adjectival. *iamque* (= *et iam*) merely serves to join the line's two participles, each of which contributes a detail of the centaur Sagittarius' appearance.

271. angusto...sidere : Capricorn the constellation occupies a smaller stretch of the ecliptic than the others, and less than the 30° share assigned to its sign.

271f. flexus...inflexa : the first example of Manilius's tendency to employ the simplex and a compound build from the same stem in close proximity (see Housman ad loc. and on 3.122).

273. Manilius is generally held in error for presenting his zodiacal fish as swimming into the water poured by Aquarius (272): it is *Piscis Notius*, not *Pisces*, that lies directly under Aquarius' urn. However, it is possible that Manilius is imagining *Pisces* in their motion through the sky. For, just as Cancer follows Gemini, *Pisces* can reasonably be said to be 'moving up towards' (*subeuntibus*) Aquarius' water as they rise.

275-293: The axis of the universe

The heavens turn about a fixed axis, which runs between the northernmost and southernmost points of the universe (the poles) and passes through the middle of the earth. The axis has neither solid form nor mass (285f.), and is too thin to rotate (290f.).

Manilius's decision to preface his description of the northern constellations with a note on the axis is a clear nod to the Aratean tradition, and there are many close verbal echoes with *Germ.* 19-23. However, Manilius's two long sentences differ greatly in focus from Aratus' own brief description of the axis (*Arat.* 21-26). Unlike his predecessor, Manilius devotes most of his attention to the physical nature of the axis, touching upon two major debates that the Aratean passage provoked among its commentators (see 277, 285f. nn.).

Later mentions of the axis include whimsical metaphors that require us to imagine

it as an actual physical object (see 375f. *axe | imo subnixum...mundum*, 443f. *axem stridentem*, 3.356f. [*caelum*] *quem gelidus rigidis fulcit compagibus axis*). Such images, however, which could easily mislead the student, are avoided here.

275. ad Arctos : by far the commonest Latin term for the Bears is the Greek transliteration *Arctos*, pl. *Arctoe*. Cicero appears to have preferred the Latinised form *Arctus* (Cic. *Arat.* fr. 16.2), but is followed in this choice only by Hyginus. *Ursa*, the obvious calque, does not appear before Ovid, and then only twice in Manilius (619; 5.703).

276. Straddling the topmost point of heaven, the Bears can be said to ‘look down’ upon all the other stars. For the wording, cf. Catull. 66.1, Ov. *Ars Am.* 2.87.

277. nec norunt obitus : ‘and have no experience of setting’: the Bears are far enough north that, for any observer at a latitude greater than about +35°, they never pass below the horizon. Cf. the astronomically equivalent 610, 656 and Germ. 63 *Oceani tumidis ignotae fluctibus arctoe*.

unoque in vertice : i.e. the North Pole. With only one exception (5.693), Manilius uses the appropriate technical term *polus* only ever as metonymy for the whole sky.

in diversa : ‘in different directions’. On Manilius’s fondness for this kind of expression see 207n.

caelumque et sidera torquent : while for Aratus it is the axis that turns the sky around (Arat. 23), Manilius holds the heavens (and more specifically the Bears) responsible for their own rotation. The image of the Bears turning the sky may owe some debt to the Hermetic tradition: cf. *Corpus Hermeticum* 5.4, ‘Who owns this instrument (ὄργανον: a millwheel?), this bear, the one that turns around itself and carries the whole cosmos with it (τὸν πάντα κόσμον συμπεριφέρουσα)?’ It reflects, at any rate, a debate recorded at sch. Arat. 23 between grammarians and μαθηματικοί (probably ‘astronomers’), over whether or not to emend Aratus’ text so that his sky drives itself (ἐαυτόν) around the axis. Manilius, it seems, has updated his poetic description of the axis to match the prevailing scientific opinion held by the μαθηματικοί. A similar ‘correction’ of Aratus, and one that may have influenced Manilius, may be found at Germ. 226f. *Lycaonis arctos | axem actu torquet* (where *axem* presumably stands metonymically for the whole sky, since his axis, too, is *immotus* (Germ. 19)).

279. aera...gelidum : Manilius thinks of the various parts of the heavens as varying in temperature along with their corresponding earthly latitudes (see 311n.). Hence the atmosphere around the poles is *gelidus*.

deducitur axis : the image is of the axis being drawn out like a newly-spun thread (*deduco*, OLD 4: the only recognised sense of the verb that suits this context).

axis: possibly introduced as a technical term by Cicero, its first attested use is in his

Aratea of c. 89 BC (fr. 33.296), where it renders Aratus' ἄξων, itself a metaphor first used in the *Phaenomena* (earlier texts use only the word πῶλος: see Kidd on Arat. 22 and 24).

280. The axis keeps the universe balanced *diverso cardine*, 'with opposite poles': the ends of the axis form two *cardines* ('poles' ← lit. 'pivots') around which the heavens wheel. The line's wording echoes Germ. 20f. *libratasque tenet terras et cardine firmo | orbem agit*. Manilius's axis, however, maintains the balance of the whole universe, not just the earth. Cf. also Cic. Arat. fr. 4 *extremusque adeo duplici de cardine uertex | dicitur esse polus*.

282. immotus at ille : cf. Germ. 19 *axis at immotus*. Manilius's repeated emphasis on the axis' fixed position (284, 292) is not just a nod to his Aratean precedents (Arat. 21f., Germ. 19), but is essential to his fundamental belief that celestial motion, as observed from earth, is regular (see 118-246n.).

magni per inania mundi : see 153n.

285f. The axis has neither solid physical form nor weight. Though Aratus himself does not address such matters, Ach. 28 mentions a dispute between geometers, who deny that the axis is anything more than a mathematical line, and the 'physical philosophers' (presumably Stoics), who claim that it consists of *pneuma*. Manilius, apparently aware of the debate, shows implicit support for the former view (see 290f. n.) without explicitly branding himself as at odds with the alternative view of the Stoics, the school to which he

owes most of his physical beliefs.

285. solidus stat robore corporis axis : cf. Verg. A. 2.639 *solidaeque suo stant robore uires.*

286. quod onus ferat aetheris alti : the clause is final. The axis need not have solid form and weight of its own so that it may bear the weight of the *aether*: for, as Manilius has already taught us (149-170) the *aether* sustains its lofty position through its own natural inclination to rise about the other elements.

287-293. The sense and structure are as follows: ‘but since the whole atmosphere is constantly revolving in a circle and the whole thing returns at every point to where it once began, whatever is in the middle...they call the axis, because it has no motion itself and sees all things move flying around it.’ Commentators have struggled to identify the causal link connecting the main clause to the two pairs of coordinated causal clauses, which are indeed elliptical at best. The first pair (287f.) makes best sense when taken as an explanation for the choice of *axis* (lit. ‘axle, spindle’) as the technical term: they call it ‘the axle’ because, like the axle of a wheel, it lies at the centre of circular, uniform rotation. The second pair of causal clauses (292f.) is more problematic. Malchin 1893, 19 ingeniously suggests that the second of the pair, (*hoc dixere axem, quia*) *videt circa volitantia cuncta moveri* (293) translates a Greek etymology found at Achilles 28: *ωνόμασται δ’ ἄξων διὰ τὸ περὶ αὐτὸν ἄγεσθαι καὶ περιδινεῖσθαι τὸν οὐρανόν.* Since Manilius appears elsewhere to be working with an ancestor of Achilles’ prose-manual, the

explanation is attractive, and would account for the redundant repetition of an idea already expressed at 287. What is harder to explain, however, is what the axis' lack of motion (292f.) has to do with the choice of term. How can an actual axle, which must rotate in order to turn a wheel, be said to lack motion? I suggest that Manilius is thinking not of rotational motion, but motion through space: for a vehicle's axle, unlike any point on the wheel it drives, can be said to remain still at all times relative to the rest of the vehicle.

289. quodcumque in medio est : the indefinite pronoun reflects Manilius's reluctance to comment explicitly on the issue of the axis' physical constitution.

290f. The axis is so thin that (1) it cannot be made to rotate (*verti...in ipsum*), (2) cannot change its angle (*inclinari*), and (3) cannot cause itself to turn in a circle (*se convertere in orbem*). (2) merely restates the claim that the axis is unmoving (see 282n.). (1) and (3), however, are tantamount to saying that the axis is nothing more than a mathematical line: since all matter, however small the quantity, has breadth (for it must occupy space in three dimensions), anything consisting of matter has the potential to be rotated about any given axis. Since the only things that cannot be rotated about certain axes are mathematical lines (which have length) and points (which do not), the axis of the universe, which has length, must be a mathematical line.

Pace van Wageningen ad loc., (1) and (3) are not quite synonymous here: no force, *external or internal*, can cause the axis to turn.

verti...in ipsum : i.e. be made to rotate through a full turn. Here *in ipsum* presumably

serves only to echo 288 (which ends with the same words), drawing the reader's attention to the contrast between the sky, which does turn (287f.), and the axis, which cannot.

290. usque adeo : this markedly Lucretian correlative (37 times in that poet) is a fitting choice for this piece of physical description.

292f. quia...non habet...videt : the asyndeton creates some potential for confusion: should we read *habet* as causal (assuming a coordinating conjunction before *videt*) or concessive (supplying *quamquam* before *motum*)? The presence of *non* in the first clause, however, hints at the structure *non X sed Y*, which at 287-293n. I have treated as the correct interpretation.

294-371: The northern constellations

Manilius leads us through the extrazodiacal constellations north of the ecliptic, beginning with those closest to the pole (294-307). For the first four of his constellations he adheres to the conventional Aratean ordering and repeats much of Aratus' descriptive detail, giving a clear signal to the reader that this part of the book will engage closely with the *Phaenomena*. From Bootes (316) onwards, however, Manilius plots his own course through the sky and carefully differentiates his portraits of the constellations from their well-worn Aratean precedents.

294-307. Circumpolar constellations: the Bears and Draco.

Manilius's circumpolar constellations inhabit a firmly defined portion of heaven around the pole (308 *hunc...orbem*), bounded by the northernmost of the celestial circles (the Arctic Circle: see 566f.). Despite mostly falling within this northern band,⁶ Cepheus is omitted: for, like every other pre-Ptolemaic star catalogue (including Aratus'), Manilius lists the constellation along with the rest of his mythological family (354-360).

294-304. In keeping with astronomical tradition, Manilius opens his catalogue of northern stars with the Bears (Ursa Major, Ursa Minor), the most easily identifiable of those constellations visible throughout the year. These eleven lines of description, which supplement the preliminary sketch of the Bears at 275-278, engage closely with the

⁶ On the Farnese Globe, all but his head is marked as north of the Arctic Circle.

corresponding Aratean passages (Arat. 27-44, Cic. Arat. fr. 5-7, Germ. 24-47) and offer a careful reformulation of their content. Though he omits the catasterism-narrative (Arat. 30-35),⁷ Manilius makes much of the Aratean idea of the Bears as navigational guides (see 298-302n.). The fact is of wider philosophical use to Manilius as well as to Aratus, seeing a rationale even behind those celestial objects with no astrological function (see 255-473n.). On the nomenclature of the Bears in Manilius see 218n., 275n., 299n.

294. tenent : perhaps ‘hold, occupy’ in a military sense (*OLD* 9a), playing upon the Bears’ tight, patrol-like rotation around the Pole (on the position of the Bears relative to the pole in antiquity, see 278n.).

eius : see 237n.

294f. miseris notissima nautis | signa : on the Bears’ traditional poetic association with navigation, see 298-302n.

miseris : the dangerous and generally disagreeable nature of seafaring is a common topos of didactic poetry from Hesiod onwards (Hes. *Op.* 236f., 618 ναυτιλίας δυσπεμφέλου; cf. *Cat.* fr. 204 West). Aratus’ frequent references to sailing mostly focus on its risks (e.g. 158f., 408-412): the self-sufficient men of his Golden Age had no need or inclination to travel upon the χαλεπή θάλασσα (110f.), a detail that captured the

7 Two later allusions, however, expect some familiarity with the identification of Helice as the mythical Callisto (2.29f., 3.359).

imagination of the Roman poets (Verg. *E.* 4.38f., Tib. 1.3.37, Ov. *Met.* 1.94f.; cf. Lucr. 5.1006, Man. 1.77f.). The sailors of the *Georgics* are similarly miserable (*G.* 3.313), and only *laeti* on returning ashore (1.304).

295. cupidus : alludes to the Ovidian aetiology of seafaring: the men of Ovid's Iron Age (that is, the current era) were driven onto the sea not by necessity but by an *amor sceleratus habendi* (*Met.* 1.129-134). This is a notable departure from the precedent of Hesiod, for whom a dearth of resources seems to be the main impetus for sea-travel (*Op.* 236f., 633f.).

296. In both sense and word order, 296 and 299 mimic Arat. 43 *μειοτέρη γὰρ πᾶσα περιστρέφεται στροφάλιγγι*. In all three cases, the noun and adjective expressing the constellation's curved path are separated to opposite ends of the line, in imitation of the Bear's circular trajectory.

Helice : see 218n.

decircinat arcum : 'describes a curve'. The verb (only in Manilius), whose literal meaning is 'to mark off with a pair of compasses' (*circinus*) introduces a novel metaphor from the domain of geometry. For the metaphor's use outside of an astronomical context, cf. Ov. *Met.* 2.271 (*Cyllenius*) *circinat auras*.

297. septem...stellae : though Aratus does not give the number of stars in Ursa Major, his Roman interpreters all give it seven, perhaps motivated by the constellation's original Latin name, *Septentriones* (Cic. Arat. fr. 5 *quas nostri Septem soliti vocitare Triones*; Germ. 27 *tres temone rotisque micant sublime quaternae*, 44 *micat...septem...flammis*; Q. Cic. fr. 1.18f.). In fact, only the earliest Greek astronomers appear to have limited the constellation to just seven stars (so Hipparch. 1.5.6), as later generations added neighbouring stars to complete the outline of a Bear.

298-302. One of several Roman renderings of Aratus' lines on the importance of the Bears to navigators seeking north (37-44): the Greeks look to Helice, the clearer of the two, while the Phoenicians prefer Cynosura who, though dimmer, is the more reliable guide as it lies closer to the pole. On the tradition, attested first in Aratus, see Kidd 1997, 189.

For comparable reworkings, all exhibiting careful variation, see Cic. Arat. fr. 7, Germ. 40-47; Ov. *Heroid.* 18.149, *Fast.* 3.107f., *Tr.* 4.3.1f.; cf. also Verg. *G.* 1.137f. Notably, Manilius offers no Roman gloss of the Bears' Greek names (contrast Cic. Arat. fr. 5f., Germ. 25f.).

298. qua duce : cf. Cic. Arat. fr. 7.1 *hac fidunt duce nocturna Phoenices in alto*, Man. 1.395 *hoc duce*.

299. See 296n. Unlike Aratus (42f.), Manilius leaves us to deduce the reason for Ursa

Minor's appeal to the Phoenicians.

Cynosura : this Greek name for Ursa Minor (lit. 'Dog's Tail') appears first at Arat. 36, but probably predates the identification of the constellation as a bear (see Kidd 1997, 188).

300f. iudice vincit | maiorem Tyrio : although *iudex* and *vinco* occur here in transferred, non-technical senses, their combined legal connotations comically suggest the absurd image of a legal battle between the Bears.

301. Tyrio. Poenis : for Manilius the two are synonymous (cf. Arat. 39 Φοίνικες, 44 Σιδόνιοι).

301f. haec certior auctor | ...pelago quaerentibus orbem : cf. Germ. 45 *certior est Cynosura tamen sulcantibus aequor*.

auctor : 'authority, expert' (i.e. on the direction north), a further whimsical characterisation.

orbem : 'dry land' (see 76n.).

303f. Circling around the pole (as they did in antiquity: see 278n.), the Bears appear to

follow each other head-to-tail, and at all times can be seen facing in opposite directions (cf. Arat. 28-30, Germ. 28-30).

paribus : ‘opposite (each other)’ (*OLD* 3b).

utraque caudam | vergit in alterius rostro : perhaps a poetic correction of Arat. 28, where each Bear’s head is said, less accurately, to point towards the other’s loins (ἐπ’ ἰξύας) rather than its tail (*caudam*).

rostrum : the mention of muzzles gives the lie to Manilius’s assertion that Ursa Major consists of seven stars (that is, just a body and a tail).

304. sequiturque sequentem : a Virgilian expression (*A.* 11.695) whose paradoxical ring held a natural appeal for Manilius.

305-307. Manilius presents Draco (which here he calls *Anguis*) as winding between and embracing both Bears. This is astronomically false: the three stars forming its tail (α, κ, λ Draconis) lie between the Bears, but only Ursa Minor is held in its grasp; most of Draco lies between that constellation and Cygnus. Malchin 1893, 49 explains the error as a misreading of Arat. 46 Δράκων, περί τ’ ἀμφί τ’ ἐαγῶς ‘writhing around and about’ (Kidd), where Manilius has taken ἀμφοτέρως (sc. ἄρκτους) from the preceding line as

governed by *περί τ' ἀμφί* as well as *δία* (45).⁸ A somewhat likelier source for the error, however, would be Virgil's erroneous (or at least ambiguous) translation of the Aratean lines at *G.* 1.244f. *elabitur Anguis | circum perque duas in morem fluminis Arctos*. There *circum* could be read as an adverb (= *περί τ' ἀμφί τ'*), but its conjunction with *per* and proximity to *duas* (rendering *ἀμφοτέρως*) point more towards a prepositional use 'around and between the two Bears' (contrast the more accurate renderings Cic. Arat. fr. 8.2 *supter superaue*, Germ. 50 *hinc atque hinc*).

However, neither explanation is satisfactory if we understand Manilius as working not from Aratus but from a graphic source such as a map or globe (see Appendix). The likeliest explanation is that Manilius here is writing under the influence of an iconographic tradition that represented Draco as embracing both Bears. This, at any rate, is how the three constellations appear at the centre of the so-called Bianchini 'Planisphere', a circular table of Greek and Eastern zodiacs tentatively dated to the second century (see Boll 1903, 299f. with plate). Though not a true planisphere, the table's vague resemblance to a chart of a celestial hemisphere inspired the inclusion of a central boss displaying the three circumpolar constellations. This, we can probably assume, was copied from some other image of the three (perhaps from an actual chart), suggesting that the erroneous representation was in wider circulation.⁹

305. has inter : both Cicero (fr. 8.1) and Germanicus (48) open their passages on Draco

8 The same mistake was apparently made by Aratus' scholiast ad loc.

9 It is possible (though by no means likely) that some images of Draco incorporated the ungrouped line of stars that now make up the faint modern constellation Lynx: if so, the result would be a snake that embraced both Bears and looked very much like the Draco of the Bianchini Planisphere.

with the same two words.

fusus : hints loosely at the Aratean and Virgilian comparisons of Draco to a river (Arat. 45, Verg. *G.* 245).

306f. Draco serves to hold the Bears in place (one of several occasions on which Manilius assigns a constellation the role of maintaining the arrangement of the heavens: see 255-473n.).

dividit et cingit...l...coeant abeantve : two exemplary Manilian paradoxes drive home Draco's role in preserving the celestial *status quo*.

306. Anguis : Latin poets of all ages indiscriminately apply the terms *anguis*, *serpens* and even *draco* to the three serpent-constellations (Draco, Serpens and Hydra), as well as their inherited Greek names. Manilius calls the constellation by its proper name *Draco* at 452 and 627 (cf. 5.715 where *dracones* denotes both Draco and Serpens), but plainly feels no obligation to share the name with his reader at this stage.

307. ne...umquam : the final clause whimsically imbues the Snake with a deliberate intention of keeping the Bears in place forever.

308-313. *Introduction: the stars of the northern Temperate Zone*

As for his passage introducing the constellations of the southern sky (373-386), Manilius prefaces his catalogue of the remaining northern constellations with several lines defining the geographical region above which the stars in question hang (cf. Arat. 319-321). This first passage is of particular interest for the insight it offers into Manilius's unique theory of climate, a subject puzzlingly ignored by previous commentators. 310-313, in particular, offer an explanation for the supposed fertility of the parts of the earth that share their latitudes with these constellations – lands that mostly (though not entirely: see 311n.) correspond to the northern Temperate Zone of classical geography. Of the stars that lie between the ecliptic and the circumpolar region, those closer to the south are in some way 'hotter' and those further north 'colder'. In combination, however, their conflicting impacts on the atmosphere yield a moderate and fertile climate.

This theory has some basis in ancient traditions of natural philosophy: the proximity of equatorial regions to the path of the Sun was broadly (and correctly) recognised as a principal reason for their aridity, though no author makes a clear causal link between actual constellations and the climate of the lands below them. Manilius's theory of climate is, more importantly, a straightforward deduction from the basic tenets of his astrology: changes in air-temperature and the growth of crops, like all events, have their causal origins in the movements of stars. The stars responsible, however, cannot merely be those of the zodiacal constellations, which for Manilius are tied more specifically to individual lands and peoples and are made responsible for the racial and

cultural differences the lands exhibit (4.807-817), even – crucially – those sharing a latitude. General latitudinal trends in climate must, then, be assigned to other stars; and in an interconnected, mechanistic universe such as Manilius's, it makes most sense to give this role to those stars physically closest to the parts of the earth's atmosphere under discussion.

These lines, then, offer a gentle rejection of a contemporary astronomical belief that the stars do not cause, but merely indicate, the weather (Gem. 17.15-45). Geminus, like Aristotle, sees weather as the product of exhalations from the earth (17.2) and therefore unaffected by the entirely separate sphere of the stars (17.15f.). Manilius gives no indication of the precise mechanics of the stars' influence on climate, but his student is by now well aware that, whatever the fine details, the celestial sphere is (despite Geminus) tightly bound to that of the earth (see 247-254n.).

Manilius makes a small error in assigning to the Temperate Zone six northern constellations that in fact lie above the Torrid Zone: Equus, Delphinus, Sagitta, Aquila, Ophiuchus and Serpens. On the mistake and its likely cause see 311n.

308. sidera septem : the planets.

309. A strikingly different reimagining of 258 (see n.). This time, the zodiacal constellations (*signa*) are not 'carrying' the Sun (*portant*, 258) but striving against it (*contra nitentia*).

bis sena : i.e. *duodena*. Such periphrases abound in Manilius's later, more arithmetically dense, books, often providing a metrically convenient alternative to an unwieldy number-word.

310. mixta ex diversis...viribus astra : 'constellations varied in their diverse powers'. We are not, I think, to imagine individual *astra* as being in some way 'mixed', but the whole set as being internally various (*mixtus*, OLD a). Each one has its own specific *vis* over the climate of the land below it, a power determined by its distance from each of the extremes, the Sun's path and the pole. **mixta** with *ex* is prosy, occurring only here in classical verse.

consurgunt : probably just 'rise', although the prefix *con-* may look forward to these constellations' roles in Book 5 as *paranattellonta* (constellations sharing their rising with specific degrees of the zodiac). The important detail, setting them apart from the previous group of circumpolar constellations, is that they do in fact rise and set below the horizon.

311. '[stars] near the cold part of heaven on the one side, and next to its flames on the other'.

gelu : GLV have *poli* and N *polo*, suggesting that one or the other was present in the archetype. Emendation, however, is necessary on several counts: for Manilius, *polus* normally denotes the entire sky (see 225n.) and so is unacceptable here. Nor can Manilius

have written ‘those near the *pole*’, as that would refer to the circumpolar group, with which he has already dealt (294-307). *hinc...flammis*, finally, leads us to suspect that behind the transmitted *polo/poli* lies a more clearly contrasting noun following the first *hinc*. If only as a diagnostic emendation, Bentley’s *gelu* is wholly adequate in sense and style and (*contra* Flores) should be maintained.

caelique...flammis : an obscure phrase that must denote a specific, hotter part of heaven to contrast with the *gelu*. The *flammae* cannot therefore be the fiery element, of which the entire celestial sphere consists (149-151), or the stars (as at 225), which are spread all over it. It must, then, be either metaphorical (‘the hot part of heaven’) or a metonymy, in which the *flammae* stand for the Sun, their one other conceivable source (as at 584, 732, 743; cf. especially 4.836). The referent in both cases is the Torrid Zone, the central band of earth which, having the Sun pass over it directly, is inhospitably hot (the zone is delimited by the two tropics, the furthest points north and south in the Sun’s course). Eratosthenes describes the zone as *τυπτομένη φλογμοῖσιν* (sc. *τοῦ ἡλίου*, fr. 16.5 Powell), suggesting that Manilius’s *flammae* are also those of the Sun. This would accord well with conventional astronomical descriptions of the Torrid Zone as that ‘lying under the very path of the Sun’ (373f.; Gem. 15.3; cf. Ach. 29, Ptol. 2.2).

Since the *caeli flammae*, thus understood, could refer not just to the Torrid Zone but also to the ecliptic (the actual linear path of the Sun), it may be possible to explain Manilius’s erroneous inclusion of several constellations among those of the Temperate Zone. These, though really belonging to the Torrid Zone, nonetheless lie between the

circumpolar region and the ecliptic line. It cannot have helped that Aratus used the ecliptic (the ἡλιόιο κέλευθος, 321) as the dividing line between his northern and southern groups. Given this, and the two possible meanings of ‘the Sun’s path’, it is easy to imagine Manilius confusedly labelling stars north of the ecliptic as ones north of the entire Torrid Zone.

312f. ‘Since a distinct atmosphere moderates these constellations (i.e. their influences on temperature) wherever it is at variance with them, they render the earth beneath them fruitful for men.’ The idea behind this opaque sentence is, I believe, this: the stars, all with different powers over the climate (310), variously exert a warming or cooling influence on the air beneath them; this air, having reached a temperature matching the mean average of those influences, in turn moderates the effect of each individual constellation on the part of the atmosphere directly below it. This may be Manilius’s way of explaining in passing why sharp boundaries do not exist between neighbouring regions of differing climates, and why the vague boundaries that do exist correspond in no obvious way with the layout of the constellations.

312. dissimilis...aer : i.e. distinct from those of the hot and cold regions (311).

qua : construed by Goold as a causal conjunction – an anachronism (the sense is not attested before Seneca and Celsus) that produces an unlikely pleonasm from *dissimilis...qua pugnat* (‘different from X in so far as it is at variance with X’). Taking *qua*

to mean ‘wherever’ (*OLD* 4b) yields better sense: at any place on earth where the air-temperature is at odds with that imbued by the stars above it, the air will moderate the stars’ influence over the temperature.

314-370. *Stars north of the ecliptic*

In his tour of the northern constellations, Manilius leads us at first to expect just another *Aratea*: not only does he begin with Engonasin, but offers a near-translation of Aratus’ lines on that constellation (63-70). He then strikes off on a course that is very much his own, albeit with several passages in which he follows the ordering of Geminus (see 255-473n.). In his choice of mythological and descriptive detail, too, Manilius’s catalogue gradually becomes less and less Aratean in character, eschewing the traditional concern for precisely locating the constellations in relation to each other.

314f. *Engonasin*. The ‘figure on bended knee’, we will later learn, is known by his Greek name Engonasin (5.646, following Arat. 66). Ps.-Eratosth. 4 and most later authorities identify him as Hercules, but for Manilius his true origin is unknown and a matter of controversy (5.646 *cui nulla fides sub origine constat*).

314. proxima...Arctos : as Aratus (63, 69f.) and his translators rightly observe, Engonasin is in fact closer to Draco than either Bear. Manilius’s inaccuracy here supports my suspicion that the representation of the circumpolar constellations on his visual source

was in some way defective (see 305-307n.).

frigentis Arctos : a borrowing from the poetic tradition (cf. Verg. *A.* 6.16 *gelidas...Arctos*, Ov. *Met.* 4.625 *gelidas Arctos*) but happily consistent with Manilius's theory of 'hotter' and 'colder' constellations (see 308-313n., 375n.).

315. nixa...species genibus : cf. Cic. *Arat.* fr. 12.1 (*imago*) *genibus...nixa*, Germ. 67 (*effigies*) *dextro...genu nixus*, Man. 5.645 *nixa genu species*. Notably, all three poets offer a different rendering of Aratus' original *εἶδωλον* (64).

sibi conscia causae : a humorous rephrasing of Aratus' original claim that nobody knows the purpose of his toiling (64f.). Manilius's words may be intended more specifically as a response to Germ. 66 *non cognita causa laboris*, pointing out that at least *someone* (the figure himself) knows what he is trying to achieve.

316-318. Boötes. Behind his back shines the 'Bear-guard' (*Arctophylax*), also known as Boötes ('ploughman') for his resemblance to a man ploughing. He carries the star Arcturus along with him. Despite several problems with the text here, it is clear that the lines are based closely on the traditional Aratean material (*Arat.* 91-95, Cic. *Arat.* fr. 16, Germ. 90-95).

The location of the ailment is plainly 317, which remains difficult even if, with Housman and Goold, we posit a lacuna after 316. With the line as it stands, *similis* is most

troublesome: Manilius cannot have likened Boötes to *iuncti iuvenici*, as the real point of similarity is with their driver. Nor should we posit a separate dative for *similis* to govern in a preceding, lost line: that would rob 317 of its much-needed simile-word (Boötes is only *like* one driving cattle – he does not actually have any to drive). Without a dependent genitive, *de more* cannot serve this function (it cannot govern an ablative absolute).¹⁰ As Housman acknowledges ad loc., it can only have its absolute sense here (‘as one does, as is fitting’). Secondly, there is nothing in the transmitted text before 317 to warrant the causal *quod* in that line.

The best solution, offered by Schmidt 1853, posits no lacuna and emends 317 thus: *instanti similis iunctis temone iuvenici* (‘like one driving on cattle joined by the tongue of a plough’). This restores the appropriate sense and accords in style and diction with the corresponding Aratean passages: for *instanti similis* cf. Arat. 91 ἐλάοντι εἰκῶς, for *iunctis temone* cf. Cic. Arat. *temone adiunctam*. It also relieves us of the suspiciously and uncharacteristically otiose *de more*. But what brought about the corruption? I suggest that *temone* became *de more* through the similarity of the line-end to Verg. A. 3.369 (*caesis...*) *de more iuvenici*. A similar slip may lie behind *idemque Bootes* | *quod*, through its closeness to the parallel Ciceronian lines *dicitur esse Bootes* | *quod* (fr. 16.1f.). The introduction of an additional clause would then require the ‘correction’ of participle *instanti* to finite *instat*.

316. Arctophylax...idemque Bootes : staying true to Aratean tradition, Manilius offer both of the constellation’s Greek names (Arat. 92, Cic. Arat. fr. 16.1; cf. Ov. *Fast.* 3.405

¹⁰ For this reason we must reject Flores’ emendation to *simili...de more*.

sive est Arctophylax, sive est piger ille Bootes). On the nomenclature of the constellation and its principal star Arcturus (also the ‘Bear-watcher’), see Kidd 1997, 213.

318. medio sub pectore : Arcturus really lies just above Boötes’ knee: ὑπὸ ζώνῃ, as Arat. 94 states. Manilius’s inaccuracy may derive from Cicero’s less than precise rendering *subter praecordia* (fr. 16.3).

319-323. Corona. Manilius offers a markedly elaborated version of Aratus’ short passage on the Crown (71-3), supposedly a tribute to Ariadne (A. R. 3.1003, Catull. 66.60f., Verg. *G.* 1.222) left by Dionysus (Arat. 71f., Ps.-Eratosth. 5, Ov. *Ars Am.* 1.556-558, *Fast.* 3.459-516).

319. at parte ex alia : ‘on another side’ (of Boötes from Arcturus). 319 shares these opening words with Verg. *A.* 10.362, Cic. Arat. fr. 33.367 and Catull. 64.251 which, given the connection with Ariadne, may well be Manilius’s inspiration here.

claro...orbe : a pun. Corona is a dim constellation (so not literally *clarus*), but one that is ‘famous’ (the adjective’s figurative sense): cf. Arat. 71f. Στέφανος, τὸν ἀγλαὸν ἔθηκε | σῆμ’ ἔμεναι Διόνυσος, Ov. *Met.* 8.177-179 [*Liber*] *utque perenni | sidere clara foret, sumptam de fronte coronam | inmisit caelo*, Germ. 71 *clara Ariadnaeo sacrata est igne Corona*.

320-322. The Crown, though dim, has one predominant star at its middle (Alphecca, magnitude 2.21). This un-Aratean detail marks Manilius's first major departure in content from the tradition.

320. stella vincitur una : see 384n.

vincitur : yet more word-play: the band is both 'dominated' (← *vinco*, so Goold) and 'fastened together' (← *vincio*) by its brightest star.

323. Cnosia desertae...monumenta puellae : cf. 5.21 *Ariadnaeae caelestia dona Coronae*, 5.253 *clara Ariadnaeae...monumenta Coronae*. All three are modelled in part on Verg. *G.* 1.222 *Cnosiaque ardentis...stella Coronae* and Ov. *Fast* 3.513 *monumenta coronae*. For **monumenta** cf. also Arat. 72 *σημ'...ἀποιχομένης Ἀριάδνης*.

324-330. *Lyra*. In another major break from Aratean precedent, Manilius now turns to the Lyre, a small constellation listed rather later in the *Phaenomena* and its translations. He now also dispenses with the conventional indications of a star-group's position in relation to its neighbours: we are told merely that Lyra 'is seen among the stars' (324f. *inter sidera* | *conspicitur*) and are left to find its precise location ourselves. This may be another sign that Manilius expects his readers to have a visual aid before them: Lyra is a small constellation and does not even lie next to its two neighbours in the text (Corona and Ophiuchus), and would otherwise be practically impossible for an inexperienced reader to

find.

In yet another departure from tradition, Manilius rejects Aratus' catasterism-narrative, claiming that the Lyre owes its place in heaven to the prestige of its former owner, Orpheus (325-327), not, as Arat. 268-271 states, because its inventor Hermes immortalised it there (Ps.-Eratosth. 24, followed by Hyg. *Astr.* 2.7, presents a composite of both myths). Manilius alludes to the Lyre's provenance only later, and vaguely (5.324f.).

Other authors use *Fides* ('lyre, lute') as a Latin name for the constellation (Cic. Arat. fr. 33.43, Varr. *R.* 2.5.12). The name later appears in Manilius, but with apparent error: in his passage on simultaneous rising influences, Manilius treats Lyra and 'Fides' separately (5.324-338, 5.409-415), as if distinct constellations. On the error – or deliberate disinformation – see Goold 1977, xciv-xcvi and Hübner 2010, ii.243-245.

324. diductis...cornibus : not true of the small constellation, which has too few stars to reflect such detail. Here Manilius may be describing the representation of Lyra in a graphic source.

325-327. This brief narrative is retold at 5.326-328, opening with the same words (*qua quondam*) but otherwise carefully reconfigured.

327. domuitque infernas carmine leges : cf. 5.328 [*Orpheus addidit*] *morti denique finem*. Notably, neither of Manilius's Orpheus-narratives hints at his failure to retrieve his

wife Eurydice from the underworld, a detail similarly omitted by the mythographers. Goold 1954 (ad loc.) has persuasively argued that Orpheus' backward glance and consequent loss of Eurydice are Virgilian inventions (*G.* 4.453-527) adopted later by Ovid (*Met.* 10.1-73), which would account for their absence here and from earlier versions (contrast Eur. *Alc.* 357-360, which implies that Orpheus managed to retrieve his wife from Hades).

328. *similisque potentia causae* : 'a power similar to [that which was] the reason [for its inclusion among the constellations]'.

329f. The lyre's former power to make objects of all natures follow it is preserved in the heavens, where it leads the other constellations through the sky. Manilius may be indulging in some poetic exaggeration here, but the detail fits a wider pattern of heavenly interactions in Manilius's star-catalogue that strengthen our impression of the cosmos as an interconnected organism (see 255-473n.) The theme of the power of music over the stars is one dear to Manilius (cf. 1.1-4).

329. *silvas et saxa trahens* : this narrative detail is drawn, with similar wording, from Ov. *Trist.* 4.17f. and *Met.* 11.1f. Both traditions of Ps.-Eratosth. 24 describe the lyre's supernatural power over beasts (so also Hyg. 2.7, citing Eratosthenes), but only the *Epitome* mentions rocks, and neither trees.

330. Cf. Verg. *G.* 2.153 *nec rapit immensos orbis per humum [anguis]*. That the following constellation in Manilius's catalogue bears a snake may well have put brought this Virgilian line to Manilius's mind.

rapit : 'makes off with' (Goold), an amusing exaggeration that carries little threat to the student's belief in the regularity of celestial motion.

331-336. *Ophiuchus and Serpens*. The Serpent-holder (Ὀφιο-οχος) and Serpent are generally treated as a single star-group by the Aratean tradition, but are otherwise listed as distinct by ancient and modern astronomers alike. The plight of Ophiuchus in his battle with the Serpent is rather more miserable in Aratus (74-87) than in Manilius, who puts the two combatants on a par in their eternal combat (336). The passage's word-order is at once both convoluted (see 331f. n.) and repetitious, with a run of line-initial finite verbs underlining the unending nature of the struggle (332-335). Again the student is given no help in locating the constellation and must resort to a visual guide.

331. Ophiuchus : also *Anguitenens* (5.389). Both names appear in Cicero's *Aratea* (fr. 13.1; fr. 33.261 etc.), but all other poets avoid the translation.

331f. serpentem...Ophiuchus...| dividit et torto cingentem corpore corpus : the intertwining of the several noun-phrases mirrors that of the constellations and conveys their entangled arrangement in far fewer words than do Aratus' more straightforwardly

descriptive lines.

dividit...cingentem : echoes, but does not strictly repeat, the earlier Manilian paradox *dividit et cingit* (306).

dividit : a reference to the conventional representation of the figures in art, with part of the Serpent's middle concealed behind Ophiuchus' legs (as, for instance, on the Farnese Globe).

334. respicit : here begins a gamma-type acrostic RESPIC(I)T. On its function and apparent incompleteness see p. 114.

molli cervice reflexus : borrowed from Cic. Arat. 9.5 *a tereti ceruice reflexum* (of Draco's head); cf. Lucr. 6.744 *molli cervice profusae*, Verg. A 8.633 *tereti ceruice reflexa*.

336. The two figures, equal in strength, are locked in eternal conflict. Once again, the focus on the constellations' interaction shows the cosmos to be a single, interconnected organism (see 255-473n.).

semper erit : a characteristically Manilian statement of acceptance: cf. 145, 521, 5.146f.

337-341. *Cygnus*. Jupiter himself placed the Swan in the sky, in honour of the form in

which he seduced Leda, mother of Helen. This narrative detail marks another divergence from Aratus, who offers no catasterism myth for the constellation, which he and Cicero call merely 'The Bird' (*ὄρνις*; *Ales*, *Volucris*).

The identification of this prominent star-group with a swan (*κύκνος*), and more specifically with the swan-shape once taken by Zeus, is found first at Ps.-Eratosth. 25, which offers virtually the same myth as Manilius's, only with Nemesis, not Leda, as Zeus' lover and Helen's mother. Germanicus, expanding upon his Aratean model, offers two possible identities for 'the Bird', Phoebus' son Cycnus and Leda's 'winged adulterer' (275-277).

337. proxima sors Cycni : i.e. 'it is the lot of the Swan to be listed next' (vel sim.). Given that some distance separates Ophiuchus from Cygnus, *proxima* is unlikely to be meant locally (though cf. 155 *tertia sors undas stravit*, with both local and temporal implications).

Cycni : on the variation in orthography between *Cycnus* and *Cygnus*, see Housman 1931, xxii.

339f. Manilius's two-line account of the seduction of Leda casts a rather more favourable light on the event than Germanicus' scandal-tinged description of the swan, *Ledae thalamis qui illapsus adulter | furta Iovis falsa volucer sub imagine textit* (276f.).

341. diductas...in alas: if Cygnus resembles a swan at all, it resembles one in flight: its

five brightest stars form a crucifix, with the four arms representing the swan's long neck, tail and spread wings, and with two further slightly dimmer stars marking the wing-tips.

342f. *Sagitta*. The Arrow is one of two constellations whose stars are said merely to resemble (*imitata*, 342), rather than to constitute, a certain object (so also Hydra: 415f.). This provides a significant insight into the ontological status Manilius awards to his constellations: like Aratus, he is not committed to a belief in the constellations as anything more than star-groups resembling certain specific objects. Though those groups may resemble specific things by God's design, it is not necessary that they also *are* those things (as the general ancient understanding of catasterism would have us believe).

volitat : see 200n.

imitata...cursum...sagittae : the Arrow in fact flies backwards. It could, however, be said to 'imitate an arrow's course' in that it appears in its nightly course to soar up and sink in an arc as if shot from a bow.

343-345. *Aquila*. The Eagle (*Ἄετός*), which elsewhere Manilius calls more explicitly *Aquila* (626, 688; 5.486, 715), is identified by Aratus and his translators as the Bird of Zeus or *Iovis Ales* (Arat. 523, Cic. Arat. fr. 33.294, Germ. 316f.). Manilius later reveals it to be the Eagle that once bore Ganymede up to the heavens for Jupiter (5.486-488), and whose more recent task was to retrieve the god's thunderbolts once cast (489f.; Germ. 317

also makes Aquila the *Iovis armiger*). Manilius's version of the Aquila myth accords in most details with Ov. *Met.* 10.155-161, but omits that Jupiter himself took the form of the Eagle when seducing Ganymede (*Met.* 10.159f.).

343. tum...fertur in altum : the implied order of rising (Sagitta then Aquila) is not quite correct, although Aquila's brightest star Altair is the first from the two star-groups to rise.

344. assueto volitans gestet ceu fulmina motu : 'flying about in its habitual motion, as if it were bearing the thunderbolts': so reads Goold's text, adopting Watt's *motu* for MSS *mundi*. The emendation, which I find convincing, draws support from the recurrent Lucretian line-ending *volitent aeterno percita motu* (Lucr. 2.1055, 3.33, 4.47) and from the constellation's appearance which, like Cygnus, most resembles a bird in flight.

345. digna Iove : because it, alone of birds, was able to bear his thunderbolts (Ov. *Met.* 10.158).

346f. Delphinus. Although, like Aratus (316-318), Manilius offers no catasterism-myth for the Dolphin, we may join Goold 1954 ad loc. in detecting an allusion to such a myth in its description as 'revered in both sea and sky' (347). For what act has the dolphin of the sea won reverence? The rescue of Arion, as van Wageningen argues (ad loc.) is a possible candidate. Goold, however, argues that the myth retailed by Ps.-Eratosthenes (*Catast.* 31) is a likelier object of allusion – that is, the tale of how a dolphin persuaded Amphitrite to

marry Neptune. This myth, just as significantly, is also attached to Delphinus by Germanicus (322f.).

346. tum : Manilius provides the order of risings correctly this time (Delphinus after Aquila).

de ponto surgit...ad astra : an amusing play on the habit of dolphins to leap and on the conventional description of constellations as rising from and setting in the ocean (e.g. Hes. *Op.* 566 Ἄρκτουῦρος προλιπῶν ἱερὸν ῥόον Ὀκεανοῖο).

347-350. Equus (modern Pegasus). Manilius gives no indication of his Horse's origins, spurning both Aratus' aetiological myth of Hippocrene, the spring that gushed forth from where the horse's hoof struck Helicon (205-224, Germ. 218-220), and the later, more widespread identification with Pegasus (Ps.-Eratosth. 18, Ov. *Fast.* 3.449-458, Germ. 222f.). Goold's belief that Manilius's Horse is winged (comm. ad loc.) is poorly founded, reading too much into its later description as *aerius* (5.633). However, since the constellation is given wings on the Farnese Globe, it is possible nonetheless that Manilius's visual source bore a similar depiction.

348f. Manilius imbues the figure of his Horse with an unusual dynamism: though really it moves only slowly across the sky (and upside down to boot), in Manilius's words it 'hurries on' (*festinat*), 'striving in its swift course to overtake' the Dolphin. The language captures

the galloping pose struck by the Horse, and plays upon the Aratean penchant for imaginative hyperbole of this kind, conspicuous in that poet's application of the verbs of running, chase and flight to constellations (Arat. 275, 316, 384, 646-649, 678: see also Man. 1.396). As in the combat of Ophiuchus and his Serpent (331-6) the Horse's pursuit is an eternal one and, we are left feeling, one on which the regularity of celestial motion depends.

348. rapido...cursu : used again at 396 of Canis Major.

349. pectus fulgenti sidere clarus : the Horse's breast is marked by Scheat (β Pegasi, magnitude 2.42), the constellation's second brightest star after Enif (ϵ Pegasi) at its head.

350. finitur in Andromeda : only the front half of the Horse appears in the sky, and it shares one of the stars of belly with Andromeda, whose head it marks. Ancient authors disagree over which constellation this star (now α Andromedae) belonged to: for Aratus it is common to both (205-207; so also Vitr. 9.4.3), Hipparchus attaches it to Pegasus (3.4.6) and Hyginus to Andromeda (3.17). There may be a touch of diplomacy in Manilius's reluctance to assign the star explicitly to either one (cf. Germ. 208f., likewise ambiguous).

351f. [quam...cui] : plainly an interpolation. As Goold observes (comm. ad loc.), the trisyllabic *Perseus* gives the game away, as do the unexplained *eripiat* and the general

redundancy of the content. The interpolator, it seems, had not looked ahead and seen that the constellations Perseus and Andromeda soon receive their proper treatment (355-360).

351-354. *Deltoton* (modern *Triangulum*). This small and fairly dim constellation is, as every star-poet is keen to stress, an isosceles triangle (Arat. 233-238, Germ. 234-238, Cic. Arat. fr. 33.5-10). Manilius here calls it by its Aratean name $\Delta\epsilon\lambda\tau\omega\tau\acute{o}\nu$ (so also Gem. 3.8, Ps.-Eratosth. 20, Germ. 235), but later also *Trigonum* (615: so too Eudox. fr. 34, Hipp. 1.6.5).

Some overly brave conjectures from Housman have bestowed upon his and Goold's texts an obscurity uncharacteristic of Manilius, and future editors would do well to consider the more economical reading of Hübner 2005, which I mostly advocate here. Largely accepting the transmitted text, Hübner emends only O's *divisus* to *divisum* (following Regiomontanus) and chooses GL²N's *dispar* over M's nonsensical *dispas*. I find fault only with Hübner's faith in *lampada*, which he takes (implausibly) as a 1decl. nom. sg. variant of *lampas*, a form that is attested but has no relevant poetic authority. The real fault, however, lies in the general unsuitability of the noun in this context: I cannot believe that Manilius, having spoken already of the triangle's two equal sides (351f.), goes on to speak – meaninglessly – of a 'third star' (i.e. point), instead of a third line. I am inclined, for that reason, to accept Bentley's conjecture *linea* for *lampada*, a word of good Manilian authority, with 13 of 15 instances in this metrical *sedes*. Let our text, then, read thus:

succedit iniquo

divisum spatio, quod tertia linea dispar 352

conspicitur paribus, Deltoton nomine sidus

ex simili dictum

‘There follows a constellation split at an unequal distance [i.e. an isosceles, its two ‘legs’ parted by a third side unequal to them], since its third line is seen to be unequal to the two equal ones. It is called Deltoton, named after its likeness.’

351f. iniquo...spatio : an inversion of Cic. Arat. fr. 33.8 *huic spatio ductum simili latus extat utrumque* and Germ. 237f. *aequata duorum (sc. laterum) | sunt spatia, unius brevius*, both rendering Arat. 235f. (πλευρῆσιν) *ἰσαιομένησιν* εὐκὸς | ἀμφοτέρῃς.

352f. The clause, if my reading is correct (see text above), echoes Cic. Arat. fr. 33.8f. *huic spatio ductum simili latus extat utrumque; | at non tertia pars lateris: namque est minor illis*. Perhaps observing his error, Manilius does not join Cicero in going on to say that the third side is brighter (fr. 33.10, so also Germ. 258), a mis-translation of Arat. 236f. ἡ δ’ (sc. πλευρῆ) οὔτι τόση, μάλα δ’ ἐστὶν ἐτοιμία εὐρέσθαι· περὶ γὰρ πολέων *εὐάστερός ἐστιν*.

354. ex simili dictum : diplomatically non-committal, identifying the triangle neither with the Nile Delta (as Germ. 235f. does) nor with the letter (so Cic. Arat. fr. 33.7 *simili quia forma littera claret*).

354-356. Cepheus, Cassiepia and Andromeda. Andromeda and her two royal parents all

appear as neighbours in the sky. Like Aratus (179-204), Manilius sees fit to group them together (despite Cepheus mostly falling within the Arctic Circle: see 294-307n.), but does not explicitly announce the relationship of the three. Manilius's purpose in doing so may be to cast a greater light on the figures of Andromeda and Perseus (355-360), whose myth he will later relate at great length (5.538-618). Reversing the practice of Aratus and his translators, Manilius offers scant detail concerning the parents (contrast Arat. 179-181, 195f., 653-658), while providing a compact and summary version of the tale of Perseus and Andromeda, a myth to which Aratus makes not so much as a passing mention.

355. in poenas...suas : an allusion to a tale which, according to Hyg. 2.10, was told by *Euripides et Sophocles et alii complures*: Cassiepeia boasted that her beauty rivalled that of the Nereids, for which her punishment was to fly upside-down through the night sky (cf. Arat. 657f.).

resupina : an unconvincingly bold conjecture of Housman's, based on Hyg. 2.10 *resupinato capite*. I join Flores in favouring the universally transmitted *signata*, which makes adequate sense in the context ('made conspicuous in accordance with her punishments').

Cassiepeia : on the various spellings of this name see Kidd 1997, 251.

356. vastos metuentem Pristis hiatus : in offering a highly-condensed, first version of

the Andromeda myth, Manilius cannot avoid mentioning Cetus, a southern constellation but one of central importance to the myth: Cassiepeia's boast (see 355n.) incurred the wrath of Neptune, who sent a flood and a sea-monster upon Cepheus' kingdom. The only means of escape from this blight was to sacrifice the princess, Andromeda, to the monster (5.540-548).

Pristis : Germanicus' preferred Greek name for the sea-beast Cetus; Cicero favours the Latinised alternative *Pistris*, and Manilius, elsewhere, the more familiar Aratean name *Cetos* (433, 5.15, 656).

[357.] The line is justly omitted by all editors. As Housman observes ad loc., the syntax of the resulting sequence *succedit Deltoton Cepheusque et Cassiepia iuxtaque Andromedan deflet* is condemnation enough. Housman is surely right to assume that the interpolator, taking *iuxta* as adverbial rather than prepositional, had been flummoxed by the accusative *Andromedan*.

358-360. *Perseus*. Andromeda's lover and rescuer (5.538-618) receives a compact but colourful description, the two lines touching upon several main points of the myth (love, rescue, the powers of the Gorgon's head). Contrast Arat. 248-253, where we learn only that Perseus is Andromeda's suitor and resembles a man running, and Germ. 247-254 which, even with its small-scale elaborations, hints only lightly at the legend.

358. ni veterem Perseus caelo quoque servet amorem : ‘if Perseus did not retain his old love in heaven too’. The remote conditional depends not on 356 *metuentem* (‘would be afraid...if Perseus did not maintain his love...’), but on an apodosis in ellipsis (*Andromedam...metuentem, [quae pereat] ni...Perseus...servet amorem*, ‘Andromeda, [who would die] if Perseus did not retain his love’). Virgil offers two sentences of parallel form, first adduced by Jakob 1832, 15: *G.* 4.454f., *A.* 12.731f. (*ensis*) *frangitur in medioque ardentem deserit ictu | (sc. et pereat) ni fuga subsidio subeat.*

veterem...amorem : that is, the love that originally drove Perseus to rescue Andromeda on earth. Manilius leaves us to consider the amusing possibility that, just as on earth, the catasterised Andromeda depends for her survival on the catasterised Perseus, adding a further degree of dramatic dynamism to the image.

359. auxilioque iuvet : for the pleonasm cf. *Ov. Met.* 9.871 *auxilioque iuva!*

Gorgonis ora : an astronomical as well as mythological detail: the small group of stars on the tip of Perseus’ left hand was known as the Γοργόνιον or ‘Gorgon’s head’ (*Gem.* 3.11), and appears on the Farnese Globe.

360. spoliūque sibi pestemque videnti : ‘a triumph for him [Perseus] but death for the beholder’ (Goold), a cryptic but catchy presentation of the *fugienda Gorgonis ora* (359). Manilius plainly assumes some familiarity with the tale of Perseus and Medusa, and even

in his long narrative (5.538-618) makes only off-hand allusions to that stage of the story.

361-364. *Heniochus (Auriga)*. The Charioteer, left unnamed by Aratus (156-166), is said by Germanicus and Ps.-Eratosthenes to be either the Athenian Erichthonius, ‘the first man to yoke horses’ (Germ. 158f., *Catast.* 13), or Mytilos, charioteer to Oenomaus: at the request of Pelops he sabotaged his master’s chariot in exchange for a night with Hippodameia, and upon requesting his reward was thrown by Pelops into the sea where he drowned (Germ. 159-162; the myth is mentioned also in *Catast.* 13). Observing that the Charioteer appears in heaven without his chariot, Germanicus favours the latter account. Not so Manilius, who does not explicitly name his Charioteer, but in calling him ‘the first to fly along on a high chariot with four yoked horses’ (363f.) reveals to learned readers his identity as Erichthonius. Accordingly, Manilius has Heniochus still driving his chariot even in heaven (5.68f.), a point on which he goes against not just Germanicus but also the iconography of the Farnese and Mainz globes.

361. tum : at Mediterranean latitudes – far enough south, that is, for Auriga and Perseus to pass below the horizon – the former does indeed rise after the latter.

vicina ferens nixo vestigia Tauro : the first of only three occasions on which Manilius uses the zodiacal constellations as indicators of a star-group’s position (cf. 387, 441).

vestigia : denotes the tracks of vehicles as well as feet, so is not proof that Manilius

imagines his Charioteer as standing here (contra Goold 1977, xxviii).

362. Heniochus : Manilius unvaryingly prefers the transliteration of the Aratean Ἡνίοχος over its commoner Latin calque *Auriga* (Cic. Arat. fr. 33.255, Germ. 157, etc.).

nomen adeptus : cf. Lucr. 2.998, 5.795, 821 *nomen adepta (est)*, all at line-end.

363f. quem primum curru volitantem Iuppiter alto | quadriugis conspexit equis :

Manilius's wording is strikingly close to that of Ps.-Eratosth. 13, Τοῦτον λέγουσιν ὅτι ὁ Ζεὺς ἰδὼν πρῶτον ἐν ἀνθρώποις ἄρμα ζεύξαντα ἵππων, and Hyg. 2.13's paraphrase of the former, *quem Iuppiter cum vidisset primum inter homines equos quadriugis iunxisse*.

365-370. Haedi & Capella. Both the small cluster known as the Kids and the Goat, a single star, strictly belong to Auriga (Gem. 3.12) but are listed in their own right along with that constellation by Aratus (157-166) and Germanicus (165-173). That may account for their inclusion here as distinct *sidera*, as may the opportunity of retelling Capella's catasterism myth (see 366-370n.).

365. hunc subeunt : the Goat and Kids do not in fact 'follow' or 'pass under' the Charioteer, but lie on his left shoulder and hand respectively (Gem. 3.12, Arat. 162f.).

claudentes sidere pontum : 'closing off the sea with their star'. Beginning with Aratus

(168f., 679-682) the Kids are frequently named as a sign of stormy weather, most often in connection with the sea: for a list of instances see Kidd 1997, 240f.

366-370. Manilius gives an extended (though no more detailed) version of the Aratean myth of Capella, the goat said to have given suck to Zeus (Arat. 163f., Germ. 166f.).

366. nobilis...mundi nutrito rege : ‘noble in the nourishing of heaven’s king’.

Capella : Aratus’ translators use only *Capra* for his Αἴξ. The diminutive *Capella* is first used in an astronomical context by Ovid (*Met.* 3.592, *Fast.* 5.113).

370. caeli caelum mercede rependit : ‘repaying heaven gained with the gift of heaven’ (Goold).

mercede : on the prevalent metaphorical use of *merces* and similar economic terms in Manilius, see Glauthier 2011.

[371f.] Given the colourful treatment of the Pleiades and Hyades in Aratus’ star-catalogue (254-267, 172f.), it is at first sight strange that Manilius should not include these small star-clusters in his own catalogue. Feeling their absence, an interpolator was moved to supplement Manilius’s list of northern constellations thus, even though both clusters belong not to this group but to the zodiacal constellation of Taurus (for full justification

for omitting 371f., see Housman ad loc.).

The reason why the two clusters, which later play a role in Manilius's teachings (5.118-127, 140-156), are left out of his catalogue may lie in his decision to limit his passage on the twelve zodiacal constellations to twelve lines (263-274: see n.). For like Geminus (3.1-15), Manilius prefers to treat individual stars and clusters along with the constellations in which they appear, and having placed such limitations on his zodiac, left no room for the Pleiades or Hyades.

758-804: MANILIUS ON THE TRUE NATURE OF THE MILKY WAY

1.684-757 have offered four possible answers to the question of what the Milky Way is: it could be (i) a seam in the heavens, (ii) a track left by the horses of the Sun, (iii) milk from Juno's breast, or (iv) a dense mass of stars. Manilius now provides a fifth, which he reveals as the correct answer.

758-804. *Fifth explanation: it is made up of the souls of worthy men and women*

This final account occurs nowhere in the doxographical and prose manual traditions, but owes its inspiration to Cic. *Somn. Scip.* 16, where the Milky Way is said to be the destination of human souls after death.¹ For Manilius, however, the circle's population is limited to the souls of the great and worthy (758), allowing him to boast that that the resident Roman souls now outnumber those of other nations, including the Greeks (777). Before listing the Romans, however, Manilius presents us with two other groups, the former comprising valiant heroes of the Trojan War (762-770), and the latter made up of Greeks who applied their wisdom to issues concerning the good of the state (771-776). Each group represents one of the two virtues – heroism and patriotism – that are exemplified by Manilius's Romans, a connection he leaves us to make for ourselves.

Manilius is partly in Stoic mode here, and makes clear allusion to the Chrysippean

1 Cicero is generally thought to have taken inspiration from a certain Pythagorean view of the Milky Way as the temporary resting-place of dead souls awaiting reincarnation (see Volk 2009, 244f. with Heracl. Pont. fr. 96f.). This, however, was not the standard Pythagorean view transmitted by the doxographical tradition (for which see *PP* 3.1).

idea of death (see 759n.) Although this understanding of the Milky Way is not attested for any Stoics, it is at least consistent with some of the school's opinions on the state of a virtuous man's soul after death: while the souls of most men do not last long once separated from their bodies, those of the most virtuous can live on until the *ekpyrosis* (L-S 53W = Eusebius *PE* 15.20.6 = *SVF* 2.809). If Manilius knew of this Stoic belief, it could explain why it is these souls in particular who win immortality in his universe.

The account's greater length and final position in Manilius's list of competing views suggests an endorsement of it, and Manilius's straightforward assertion of the view at 803f. appears to confirm this. The poem's final simile, however, voices support for the fourth explanation, too, that the Milky Way is a dense mass of stars (5.742-745; 1.755-758). We should conclude, then, that for Manilius the souls of the virtuous become the stars that make up the Milky Way, an idea explored by Cicero in the *Somnium Scipionis*. What distinguishes these stars from the rest is that Nature has not given them 'powers to match their number' (5.735). To be immortalised as a star is a privilege indeed, but a heavenly existence with power over events on earth is granted to only one of Manilius's Romans, Augustus, in whom the passage reaches its climax and conclusion (see 799-802n.).

The style and diction of Manilius's catalogue of souls are overwhelmingly Virgilian, and though it is rather more condensed than any comparable passage in Virgil, Manilius's debt is palpable. The most obvious (and most discussed) parallel is the parade of Roman heroes in Verg. *A.* 6, but Manilius clearly has in mind also the Shield of Aeneas (*A.* 8.626-731: see Landolfi 1990).

Of the little scholarship devoted to the passage, interested readers are directed particularly to Landolfi 1990 and Feraboli-Scarcia ad loc.

758-761. Though Manilius will eventually reveal his support for this account of the Milky Way, he introduces it here in the form of a direct question, maintaining the inquisitive point-of-view of his fictional human observers (715-717). Goold's punctuation here (*an...fruuntur?*) is to be preferred over that of Housman, who postpones the question-mark until 799 (*an...Iulia?*), producing a more jarring transition into the following declarative sentence (*descendit caelo...Augustus*). It is hard, moreover, to imagine any early reader treating all 42 lines as part of a single direct question, especially as they contain numerous apparent sentence-ends. See further Goold 1954 ad loc.

758. fortes animae : we may detect some word-play here, since the souls are not only 'valiant' (in that they belong to heroes and great men) but also 'strong': for the Stoics, they alone are robust enough to remain long after the death of the body (see 758-804n.). **nomina** is, of course, simply poetic metonymy for the *animae*.

759. corporibus resoluta : a nod to the Stoic conception of death, which Chrysippus defines as the separation of soul from body (*ψυχῆς χωρισμὸς ἀπὸ τοῦ σώματος*, L-S 46 E = Plut. *St. rep.* 1052C = SVF 2.604; Cic. *De Amicitia* 13).

759f. The sense is obscured somewhat by the word-order: 'the souls pass hither, released

from the globe of the earth' (*terraeque remissa...ex orbe*; tr. Goold).

760. suumque habitantia caelum : 'inhabiting heaven as their own'.

761. aetherios vivunt annos : the souls live out their years in the aetherial sphere of the universe, along with the fire that makes up the stars (see 149f.).

762-770. The first group of names in Manilius's list of virtuous souls belong to heroes of the Trojan War, each of whom is clearly deemed too famous to require an explicit naming.² Provided we omit 766 (as we should: see n.), the group consists of Greeks (762-765) and Trojan allies (767-770), but no actual Trojans. Perhaps Manilius was unwilling to group the supposed ancestors of the Romans separately from their virtuous descendants. Manilius's likelier intention, however, was to highlight the patriotic virtue of his Romans who, renowned for their acts of service to the homeland (see 777-804n.), stand in strong contrast to the foreigners at Troy, who served either in their own interests or came to the assistance of allies.

762-765. Manilius's chosen Greeks exemplify the full range of heroic talents: leadership, prowess in combat and wisdom. They are, in order, the descendants of Aeacus (Achilles, Ajax), the Atreidae (Agamemnon, Menelaus), Diomedes, Odysseus and Nestor.

2 Ovid similarly refrains from naming the first few figures in his parallel catalogue (cf. *Ov. Fast.* 1.593-596).

762. hic...veneramur : Manilius now dispenses with his feigned uncertainty over the true nature of the Milky Way, and begins to speak not only as if this final explanation is true, but as if it has at least some wider support.

hic...hic : the deictics, only here in the catalogue of souls, fittingly recall Aeneas' encounter with heroes of an earlier generation: Tydeus, Parthenopaeus and Adrastus (Verg. A. 6.479f.).

Aeacidas : though the sons of Aeacus are heroes in their own right, the grandsons Achilles and Telamonian Ajax are surely meant here, since they, not their fathers, fought in the Trojan War. On that basis, it is possible that Achilles' son Neoptolemus is also meant (so Fayus; *contra* Goold 1954 ad loc.).

764. naturae victorem Ithacum : i.e. having triumphed over adversity on land and sea (763), Ulysses might be seen as having overcome all the challenges the natural world can offer.

764f. Pyliumque senecta | insignem triplici : Nestor has been a *senex* to three generations of men an allusion to the Homeric descriptions of Nestor as, variously, having outlived two generations of Pylians and ruling among a third (*Il.* 1.249-252) and as having 'thrice ruled among generations of men' (*Od.* 3.245).

[766]. The transmitted line, *castra ducum et caelique victam sub Hectore Troiam*. has been omitted by all editors since Scaliger as a mere dittography of 2.3; and rightly, since the line unsuitably includes Troy itself in a list of heroes. Less convincingly, many editors have posited a lacuna after 765, prompted by the striking absence of Hector from Manilius's list. I have given good reasons above (720-770n.) for the omission of actual Trojan heroes, and suspect that the scribe of [766] simply shared modern editors' disbelief at Hector's absence and cobbled together a solution. Like [766], moreover, the various diagnostic emendations proposed by Housman, Goold and Flores are to be rejected outright, owing to their explicit naming of heroes, something Manilius seems to have deliberately avoided in this list of heroes.

767-770. The Trojan allies listed individually are Memnon, the Aethiopian son of Dawn (767), Sarpedon, king of the Lycians and son of Zeus (767f.) and the Amazon queen Penthesilea (768f.). Among the unspecified *alios reges* (769f.), also, we can assume that the Thracian Rhesus is intended (769); and it may be no coincidence that these are the four Trojan allies commemorated in the first book of Virgil's *Aeneid* (1.100, 469f., 489, 491).

768f. nec te... | praeteream : a recurrent figure of Virgilian catalogues, e.g. *A.* 7.733 *nec tu carminibus nostris indictus abibis*, 10.185f. *non ego te... | transierim*. Cf. also 6.841 *quis te, magne Cato, ...relinquat?*

768. Mavortia virgo : the combination of proper noun (or adjective derived from one) and *virgo* at line-end is a distinctly Virgilian feature. *Mavortius* itself is also Virgilian (five times) and occurs exclusively in this *sedes* until Valerius Flaccus.

virgo : Manilius makes a point of emphasising the sex of both Penthesilea and Cloelia (*virgo* again, 780).

769f. As he did with the Greeks (765), Manilius rounds off the list of Trojan allies with unspecified kings.

769. Thracia : Housman and Goold's correction of MSS *greca* to *Thra(e)cia* is probably correct. Though some Trojan allies may have come from Greece (perhaps the Pelasgians of Larisa: Hom. *Il.* 2.840-843), their role, at least in the *Iliad*, is too small for *Graecia* here to be anything but confusing.

770. Magno maxima Pella : Goold translates, 'Pella, whose greatness lies in him called Great' (i.e. Alexander, who was born in the city; cf. 4.688f. *rege...uno* | *princeps Pella domus*). Here Pella must represent the whole region of Macedon, from which Troy's Paeonian allies originated (Hom. *Il.* 2.848-50: so Housman ad loc.). Pella itself, however, was not built until 399 BC, and serves here as a pretext for mentioning Alexander, the self-styled Homeric hero, whose absence from a list of great men might otherwise have appeared strange. For further word-play on Alexander's title, see 3.22f., 4.50-55.

771-776. The second group is made up of wise Greeks, famed for applying their minds to the good of their states. The group comprises the constitutional reformers Solon and Lycurgus, political philosophers (Plato, Socrates) and a statesman of military focus (Themistocles). Introducing the group is an extended portrait of the wise man (771-773), anticipating somewhat the vignette-style character description of Books 4 (124-291) and 5.

771. *quique* : with apparent anacolouthon, Manilius now continues his list of names in the nominative, ending the string of accusatives dependent on *veneramur* (762). Perhaps we are to assume another *hic* here; the nominative may even be looking back to 760f. (*migrant, vivunt, fruuntur*), as Housman ad loc. suggests. At any rate, the change brings Manilius's list more in line with the parallel catalogues in Virgil, and avoids the monotonous homoioteleuta that a run of accusatives would produce.

***strictae pondera mentis* :** *pondera* in this metaphorical sense (*OLD* 6) denotes the quality of deserving to be taken seriously (cf. 5.451 *vultus componit pondere mentis*; *Ov. Pont.* 3.1.158, 3.9.50). For *strictae*, *OLD* suggests 'rigorous, strict'; but since earlier poets use *strictus* almost invariably of drawn weapons, it is tempting to identify a figurative use here, of incisive minds drawn (as it were) and ready to strike.

772f. *quibus omnis in ipsis | census erat* : if this qualification is to distinguish the wise

men from the valiant heroes of the previous group, then *quibus* must look back to *pondera*, not *viri*: it is in their weightiness of mind, not simply ‘in their own selves’ (Goold) that all their value (*census*) lies.

773. iustusque Solon fortisque Lycurgus : each epithet reflects the defining attributes of each lawgiver’s reforms. Military institutions formed the heart of the Spartan constitution attributed to the mythical Lycurgus. The Athenian Solon, on the other hand, claimed to have written his laws for rich and poor alike, and offered direct justice (or ‘a fair trial’) to every man (*θεσμούς δ’ ὁμοίως τῶι κακῶι τε καὶ ἀγαθῶι | εὐθείαν εἰς ἕκαστον ἀρμόσας δίκην | ἔγραψα*, fr. 36.18-20).

774f. Plato, as author of the *Republic*, and Socrates, as the principal philosophical player in that dialogue, are natural candidates for Manilius’s list of state-minded Greeks.

774. aetheriusque Platon : interpretation of the epithet is difficult. Goold’s ‘inspired’ (so also *OLD*) has no convincing parallels to support it, and we may do better to see it as a rather forced lexical choice made for the sake of a pun. For Plato, as well as being a resident of the *aether* (761), was responsible for introducing the concept and term to classical cosmology (Plat. *Tim.* 58d2, where it denotes air in its most refined form).

fabricaverat : lit. ‘forged’. Though a common enough verb – Manilius uses it ten times – the figurative use is striking, for natural as the metaphor may seem, it occurs only once

elsewhere (Sen. *Ep.* 16.3). I therefore suspect another allusion to Platonic cosmology: just as Plato believed the Demiurge of the *Timaeus* to have crafted the universe, on the microcosmic level Manilius's Socrates 'crafted' his disciple Plato. If correct both *fabricaverat* and *aetherius* allow Manilius to pay tribute to Plato as a cosmologist, even though the passage is more immediately concerned with his political theorising.

775. 'In being condemned, Socrates condemned Athens – his own city – all the more effectively.' Though Socrates (at least the Socrates of the *Republic*) had attacked Athenian democracy at length, the city's decision to condemn him offered the clearer proof of its flaws. The polyptoton of *damno* and reflexive *suas* underline the paradoxical nature of the condemnation.

776. Themistocles owes his inclusion in Manilius's list not just to his pivotal role in the Persian War, but to his naval innovations (see Diod. Sic. 11.41), which secured Athens' lasting dominance as a maritime power.

Persidos...strarat quae classibus aequor: a reference to Xerxes' construction of pontoon bridges, supposedly out of ships lashed together (Hdt. 7.36), as a means of crossing the Hellespont and invading Greece in 480 BC. Manilius recalls the event three more times, at 3.19-21, 4.65f., 5.48f.

777-804. The third and longest list is of famous Romans, who together embody both the

heroism and concern for the state exemplified by the first two groups. Arranged in loose chronological order, the catalogue extends from the early Roman kings (excluding Tarquin, 778) down to Julius Caesar and, at the passage's climax, Augustus (800-802).³ His celestial home, however, lies not in the Milky Way but in the Zodiac, home of the gods (803).

Manilius's great Romans have all been shown to belong to the stock of traditional rhetorical *exempla*, to which Cicero and the Elder Seneca make frequent appeal (Landolfi 1990, 91f.). This accounts for the striking overlap with the comparable catalogue at Cic. *Par. St.* 11f., and with Manilius's own rhetorical disquisition on the insuperability of fate (4.23-120). In both passages, many Roman residents of Manilius's Milky Way are invoked as historical *exempla*. Many of Manilius's names also occur, unsurprisingly, in the Virgilian parade of Roman heroes (*A.* 6.756-866), which Manilius certainly has in mind here, though more as a literary device than a stylistic model (see 758-804n.).

The passage was apparently well-known enough in Tiberian Rome to provoke a parody: *Culex* 358-371, in which the eponymous gnat, passing through the underworld, encounters the shades of many of Manilius' great Romans, delivers a perfect mimicry of our passage's style.

778. Tarquinioque minus reges : Cic. *Par. St.* 11 similarly excludes Tarquinius Superbus from his exemplary kings.

3 In culminating with in Augustus, the passage bears a certain similarity with two other catalogues of great Romans: Ov. *Fast.* 1.587-616 and the much shorter Verg. *G.* 2.169-172.

778f.. Horatia proles | tota acies partus : the Horatii were triplets who in the seventh century allegedly fought the Curiatii of Alba Longa (another set of triplets) to decide the outcome of Rome's war with that city (Liv 1.24f.). Though two Horatii were killed, the remaining brother killed all three Curiatii and won the war for Rome (hence Man. 4.34 *tresque sub unius fratres virtute iacerent*).

Horatia proles : modelled on the Virgilian line-end formula *Neptunia proles* (four times; for variants see Verg. *A.* 4.258; Prop. 1.20.25; Ov. *Met.* 13.45, *Tr.* 5.1.57). See also 798f. n.

779-781. The next three early Roman heroes all won their fame in Rome's war against Lars Porsenna, king of the Etruscan city Clusium, traditionally dated to 508 BC.

779. nec non et : this conjunctive formula is a Virgilian invention and strongly reminiscent of that poet, who uses it 14 times (versus four times in Ovid and five in Manilius).

779f. Scaevola trunco | nobilior : 'ennobled by his mutilated arm' (Goold). Captured during an attempted assassination of Porsenna, C. Mucius thrust his right arm into a campfire to demonstrate his valour, winning both his release and the cognomen *Scaevola* 'left-handed' (Liv. 2.12). Cf. 4.30f.; Cic. *Par. St.* 12.

780. maiorque viris et Cloelia virgo : 'a maiden greater than men', Cloelia escaped

Porsenna's camp with a group of other Roman hostages and managed to cross the Tiber back into Rome. Porsenna demanded her return and the Romans consented. On her return, Porsenna, so impressed by her courage, granted her freedom and let her choose half of the hostages to take with her. Wisely, she chose the young boys, who stood to suffer most at the enemies' hands. Cf. 4.33.

maiorque...et Cloelia : the syntactically superfluous *et* is emphatic ('and Cloelia too').

Cloelia virgo : on the phrase-form see 768n.

781. Cocles : famed for singlehandedly defending Rome's Sublician bridge from the invading Etruscan army. Cf. 4.32f., Cic. *Par. St.* 12.

Romana ferens, quae textit, moenia : the meaning is uncertain. Housman's suggestion, 'bearing (on his shield) the Roman walls to which he gave shelter', has some cogency, since Livy 2.10 describes how all of the enemies' projectiles were blocked by Cocles' shield (so also Goold 1954 ad loc.).

782. Corvinus : Manilius Valerius, military tribune of 349 BC, whom Livy calls both Corvus and Corvinus (7.26, 32). According to Claudius Quadrigarius (fr. 12, = Gell. *N.A.* 9.11) he defeated the Gauls with the help of a divine raven (*corvus*), from which he gained his *cognomen*. Cf. Ov. *Fast.* 1.601f.

qui gestat in alite Phoebum : another allusion to the unrelated myth of Phoebus and Typhon (cf. 417). The Corvinus tale, as preserved in Gellius, does not specify which divinity was responsible for (or embodied by) the raven.

784f. Manilius Furius Camillus returned from exile to rid Rome of a Gaulish occupation (387/6 BC), for which he was hailed the city's 'second founder' (Liv. 5.46-55). Cf. 4.86. Verg. A. 825 *referentem signa Camillum*, G. 2.169.

Iove...meruit caelum : in driving out the Gauls, Camillus relieved the one remaining Roman garrison on the Capitoline Hill, site of the Temple of Jupiter. Hence it was 'by means of Jupiter' (the ablative can be only instrumental), that he earned his place in heaven.

Romamque | servando posuit : 'by saving Rome he founded Rome', alluding to Rome's recognition of Camillus as its *conditor alter* (after Romulus; Livy 5.49).

785f. Brutus : L. Junius Brutus was founder of the Roman Republic, having brought about the overthrow of Rome's last king, Tarquinius Superbus in 509 BC (Liv. 1.56-60). Cf. Cic. *Par. St.* 12, Verg. A. 6.817-823.

786. Papirius : following the disaster at the Caudine Forks (321 BC), L. Papirius Cursor

won requital from the Samnites by bringing Lucera back under Roman control. From there he sent 7000 men under the yoke, and recovered the lost standards and Roman hostages taken at Caudium (Liv. 9.15).

furti : the Samnites had lured the Roman army into the Caudine forks by deception (Liv. 9.2).

787. Fabricius Curiusque pares : C. Fabricius Luscinus (cf. Verg. A. 6.844) and M. Curius Dentatus (cf. 4.148), two main players in the struggle against Pyrrhus (280-275 BC) whose names became bywords for integrity and incorruptibility. Cf. Cic. *Senect.* 13, *Par. St.* 12 (where they are similarly paired).

787f. Marcellus : not the Manilius Claudius Marcellus of Verg. A. 6.854-892, but the earlier hero of the Hannibalic War. He is honoured here, however, for killing the Gaulish leader Vertomarus in single combat at the Battle of Clastidium (222 BC) and becoming the third Roman to win the *spolia opima* (Liv. *Perioch.* 20). For this reason Manilius calls him, metonymically, the **tertia palma** ‘third victor’, a phrase drawn from Verg. A. 5.339 *post Helymus subit, et, nunc tertia palma, Diores.*

Cossusque prior : A. Cornelius Cossus (*cos.* 428), the previous Roman to win the *spolia opima* (hence *prior*), by killing Tolumnius, king of Veii (Liv. 4.19f.). Cf. Verg. A. 6.841

789. Decii : at least two generations of Decii, each called P. Decius Mus, similarly offered up their lives to the Manes (their *vota*), in exchange for which they received crushing victories (340 and 295 BC: their *triumphi*): see Liv. 8.9, 10.28. Cicero claims on two occasions that another P. Decius Mus, grandson of the first and consul in 279, did the same (Cic. *Tusc.* 1.89. *Fin.* 2.61); but mentions only two at *Par. St.* 12. Cf. 4.86 ; Verg. *G.* 2.169, *A.* 6.824.

790. invictusque mora Fabius : Q. Fabius Maximus, whose tactics of delay during the Hannibalic War won him the agnomen *Cunctator*. Cf. 4.38f., Verg. *A.* 6.845f., Ov. *Fast.* 1.605f.

790f. victorque nefandi | Livius Hasdrubalis : Manilius Livius Salinator, who with C. Claudius Nero led the Romans to a decisive victory over Hannibal's brother Hasdrubal at the Battle of the Metaurus (207 BC).

nefandi : Bentley's emendation from MSS' impossible *necati* has good poetic authority, particularly at line-end, where Virgil has *nefandus* eight times.

792. Scipiadaeque : Scipio Africanus, who brought about Hannibal's final defeat at Zama (202 BC), and Scipio Aemilianus, his adopted son, who led the final siege and destruction of Carthage in 146 BC. Cf. Verg. *G.* 2.170, *A.* 6.843.

fatum Carthaginis unum : cf. Lucr. 3.1034 *Scipiadas...Carthaginis horror* and Verg. *A.* 6.843 *Scipiadas, clades Libyae*.

793f. orbis domitor : an acknowledgement of the widespread successes of Pompey the Great's early career, which, aside from the triumphs won in Sicily and Africa (79 BC) and Spain (71), included the eradication of piracy from the Mediterranean (67) and the defeat of Mithridates (66), feats for which he was awarded his third triumph. Cf. 920f., 4.50-55 (especially 52 *tris emenso meritos ex orbe triumphos*); Verg. *A.* 6.826-831; Ov. *Fast.* 1.603f.

794f. censu Tullius oris | emeritus fasces : being a *novus homo*, Cicero had to rely on his talents as an orator rather than his social standing to advance his public career.

fasces et : Bentley's emendation of the metrically impossible *caelum et* can offer little more than a speculative solution, but produces good sense, with *fasces* as metonymy for the consulship (*TLL* s.v. I 2a), which Cicero won in 63 BC. Goold is right to reject Burton's *caelum tum* (printed also by Flores), on the grounds that otherwise only the basic conjunctions (*et, -que; atque* once) occur in the catalogue of souls (so Goold 1954 ad loc.).

795. Claudi magna propago : the *gens Claudia*, supposed descendants of the Sabine Attus Clausus, who left his native Regillum for Rome, where he came to be called Appius Claudius (so Liv. 2.16, but cf. Verg. *A.* 7.706-709). See further Feraboli-Scarcia vol. I,

xvi-xviii.

796-799. These lines house a partial acrostic of the *gens*-name AEMI(LIA): see Feraboli-Scarcia vol. I. xix, and p. 113 n. 7 above.

796. Aemiliaeque domus proceres : the *gens Aemilia*, another leading patrician family.

Metelli : the Caecilii Metelli, a prominent plebeian family. Here Manilius may have in mind specifically the L. Caecilius Metellus who in 241 BC saved the sacred objects from a fire at the Temple of Vesta (Liv. *Perioch.* 19), an act alluded to at 4.67f.

797. Cato fortunae victor : Cato the Younger killed himself at Utica rather than suffer defeat at the hands of Caesar (46 BC). In this respect he is a ‘victor over his fortune’, having escaped an inevitable disaster. At 4.86f. Manilius praises him again for his suicide, calling him *invicta devictum mente Catonem*.

797f. fictorque sub armis | miles Agrippa suae : Goold, in a moment of weakness, accepted Housman’s tentative emendation *fictorque* (from MSS *matrisque*), which has little to support it besides the possibility of word-play with *victor* (797). I am somewhat more persuaded by Bailey’s *meritusque...suam* (sc. *fortunam*), a more economical emendation that yields better sense: Agrippa, on account of his unwavering dedication to the Roman state and to Augustus, can be said from the passage’s patriotic point-of-view to

have ‘deserved’ the successes he achieved on their behalf, most notably at Actium (31 BC).

798f. pose considerable challenges of punctuation. Should we see the *proles Iulia* as the last in the string of conjuncts that make up Manilius’s catalogue (so Goold and Housman);⁴ or is *Venerisque* the beginning of a new sentence, in which *proles Iulia* is the subject of *descendit* and *replevit* (so Volk: see 799n.)? Neither option is very agreeable: the former presents an unwelcome textual difficulty (see 799n.) and the latter makes the last entry in Manilius’s catalogue a complete sentence, which jars with the preceding string of mere noun-phrases. A compromise may prove better. Let us place a colon after *Iulia*, and treat the rest of 799 as an asyndetic explanatory clause, a device of which Manilius is very fond (e.g. 468, 470, 858, 905). Thus we can make good sense of 799 as transmitted (see n.) without destroying the stylistic consistency of the catalogue.

Venerisque ab origine proles | Iulia : i.e. Julius Caesar, alleged descendant of Venus (Suet. *Jul.* 6) through her grandson and his near-namesake Iulus (cf. Verg. *A.* 6.789f. *hic Caesar et omnis Iuli | progenies*).

799-802. Manilius’s list of Roman souls now reaches its climax in the great Augustus, whose allotted heavenly home lies not in the Milky Way but in the Zodiac, the part of heaven reserved for the gods (803). This honour is, above all, a reflection of the greatness of Rome’s first *princeps* as a ruler: for unlike those of the Milky Way, the celestial bodies

4 See further 758-761n.

of the Zodiac are responsible for the governing of earthly events.

Various textual and interpretative difficulties plague the passage. Volk's level-headed discussion (2009, 141-144) offers excellent solutions to several problems, which with minor exceptions are largely followed here. Below is what I believe is the most convincing articulation and reading of the text. Supporting argumentation is left to the lemmata; on the punctuation of 799 see 798f. n.

...Venerisque ab origine proles	798
Iulia: descendit caelo caelumque replevit.	799
quod reget Augustus socio per signa Tonante	800
cernet et in coetu divum magnumque Quirinum	801
<i>lacuna</i>	
altius aetherii quam candet circulus orbis.	802

'It (the Julian line) has descended from heaven, and heaven it has replenished. Augustus shall rule it (i.e. heaven) with the Thunderer (Jupiter) as his companion through all the signs, and shall spy in in the gathering of the gods the great Quirinus and [one or more other divine names], being on a loftier level than that on which the band of the aetherial circle (i.e. Milky Way) shines.'

799. descendit caelo caelumque replebit : Goold, following Housman, rejects MSS *repleuit* in favour of the future, and takes *Augustus* as the subject of both verbs. Like Volk,

I believe *proles Iulia* (798f.) to be the likelier subject, principally on account of the close parallel 2.57 *ille etiam caelo genitus caeloque receptus*, where *ille* is unambiguously Caesar. The perfect *replevit* can then stand as transmitted, and need not lie at the mercy of speculation over the poem's date.

800f. reget...cernit : Volk's suspicion of MSS *regit, cernit* is well-founded, since the visual sense of *cernere* 'perceive, espy', expressing a momentary event, cannot occur in the present continuous. Since we would expect the tense of *cernit* here to parallel that of *regit* (which must be a continuous present if a present at all), we must emend both. The metrically possible alternatives are (jussive) pres. subj. *regat, cernat* and fut. indic. *reget, cernet*. (Most modern editors print the latter, though on speculative chronological, rather than linguistic, grounds.) I incline towards the more assertive future, being the more flattering tribute to Augustus; but Verg. *G.* 1.32-35, which presents the Emperor's choice of resting-place as a decision yet to be made, may stand in favour of the jussive subjunctive.

While both possibilities point to a living Augustus, it remains possible that Manilius himself changed the verbs' tense after Augustus' death to remove the inconsistency with his later, unambiguously Tiberian, books. The resultant *cernit* would be forced, but conceivable were it merely a hurried correction. Like Volk, however, I cannot imagine that in an original draft Manilius could have chosen pres. *cernit* here over a more suitable verb, such as *spectat*.

800. quod : best taken as a sentence-connecting relative if a change of subject is assumed after 799 (see n.).

per signa : the *signa* here are surely those of the Zodiac (see 803n.). But are we to understand (a) that Augustus ‘will guide heaven through the signs’ (so Goold)? Alternatively, (b) does *per signa* describe Augustus’ position (‘will rule heaven, [passing] throughout the signs’)? Or (c) is *per signa* part of an ablative absolute phrase *socio per signa Tonante* (so Volk), ‘with the Thunderer as his companion throughout the signs’ (that is, with Jupiter, but not necessarily also Augustus, moving through the signs)? We should probably reject (a), on the grounds that the *caelum* does not move through the *signa*; rather, the *signa* are part of the *caelum* and move with the rest of it. We are left, then, with (b) and (c): Jupiter, being a planet, naturally moves *per signa*, but will Augustus too? And will that make him a planet as well?

I can see no good reason to prefer either reading over the other, and doubt that Manilius is claiming anything more than that the deified Augustus will reside in the Zodiac. The question of whether he will be a star or planet – or something else altogether – is wisely left unaddressed. Not only has Manilius committed himself to the idea that the arrangement of the stars can suffer no change; he apparently also suspects that Augustus may die before his poem is finished (see p. 166). In claiming so imminently falsifiable at this early stage he would risk discrediting his own work, if no new heavenly body appeared in the sky upon the Emperor’s death.

801. in coetu divum magnumque Quirinum : the syntax of the transmitted text is intelligible only if *divum* is understood as acc. sg. agreeing with *Quirinum*, rather than gen. pl. qualifying *coetu*. However, since *coetu* is meaningless without such a qualification, we should follow Housman, Goold and Volk in positing a lacuna of at least one line after 801, containing another accusative noun-phrase conjoined with *-que* or a qualification of *coetu*. If the former is true, then Quirinus may have been the first in a list of men made gods, like that of Hor. *Carm.* 3.3.9-16 and *Epist.* 2.1.5-12 (see Robinson 2011, 303). Either way, we can safely infer from 803 *illa deis sedes* that the *coetus* is one of gods.

magnumque Quirinum : on account of the widespread identification of Quirinus with the deified Romulus in Augustan verse (see Robinson 2011, 303f.) and the fact that Rome's founder receives no explicit mention in Manilius's list of great Romans, we should assume the same identity here. Manilius may have been moved to include him by Ovid's apotheosis-narrative (*Fast.* 2.475-512), which similarly makes Quirinus a resident of the heavens (478) without revealing his precise heavenly location or capacity.

802. altius : only figuratively higher ('more exalted' or 'superior': *altus*, *OLD* 11), since for Manilius all heavenly bodies are equally distant from the earth.

803f. The Milky Way is the home of the those who, 'like to the gods in excellence, have reached the heights nearest theirs. The contrast recalls the Ovidian description of the Milky Way as a road leading to the homes of Jupiter and the other greater divinities, with

the lesser gods dwelling apart from them (*Met.* 1.168-176).

proxima...fastigia tangunt : we are reminded of the *regalis animos* to whom astrology was first revealed, and whom Manilius described as *proxima tangentis rerum fastigia caelo* (42).

Commentaries

APPENDIX:

MANILIUS AND THE EARLY HISTORY OF STAR CHARTS

Today, most students of astronomy learn their way around the constellations with the aid of star charts or a computer simulation. In both cases, the curved face of the celestial sphere is presented as a flat image, which a stargazer can easily keep with her on a piece of paper or the screen of a mobile device. The practical advantages of such images may be clear to us, but in fact the star chart arrived strikingly late in the development of astronomy; far later, that is, than the mathematical and astronomical knowledge needed for their production. The earliest firm evidence for their existence is Ptolemy's *Planisphaerium*, a second-century AD treatise on the stereographic projection of the celestial sphere¹. Even then, however, there are no ancient testimonies of their widespread use among students of astronomy. This paper aims to shed new light on the early history of the star map. I shall present some evidence pointing to the use of star maps by the Roman astronomical and astrological author Manilius in the early first century AD, and discuss the likeliest date for their introduction as learning aids for the beginner astronomer.²

1 There is no widely-available English version of this text, which has survived only in Arabic and Latin translations. An adequate summary, however, can be found in Lorch 1995.

2 Throughout this article I assume that the only people for whom star charts would hold any appeal are those with an interest in astronomy for its own sake. In the period with which we are concerned, practitioners of astrology could derive all the information they needed for their predictions from so-called sign-entry almanacs. For some brief discussion of these tables and a list of surviving examples, see Jones 1999, 176, 301-307.

I. Astronomical education and its early visual aids

Throughout the Hellenistic and Roman period, written texts played a much greater part in the learning and teaching of the constellations than one might expect today. Many people, it seems, began their astronomical training with the study of a poem, Aratus' *Phaenomena*, which was being used as a school-text within a century of its publication in the mid third century BC.³ However, its role in many astronomers' education is revealed most clearly by the tradition of so-called commentaries on the poem. These were often more like intermediate-level handbooks, which gently eased the student away from the rudimentary teachings of Aratus and onto more technical matters.⁴

Poems and handbooks, however, were not the only way in which students could familiarise themselves with the constellations. By the end of the third century BC, a more practical guide to the stars had been developed: the celestial globe, decorated with the figures of the various constellations, offered students a model of the celestial sphere that could be consulted far more easily than a long written text.⁵ Three of these globes have survived, each one an impressive work of craftsmanship.⁶ The earliest and most famous is the globe held by the Farnese Atlas, in the National Archeological Museum of Naples (see Image 1). The sculpture as a whole is from the Roman era, but the globe is thought to be a reproduction of an earlier Hellenistic work.⁷ We also have two slightly more detailed metal

3 The papyrus fragment *P. Hamb.* II 121, from the first half of the second century BC, contains an extract from the *Phaenomena* for study in schools. The passage concerns the Tropic of Cancer (480-494).

4 These commentaries are collected and published in Maass 1958.

5 My estimated date may well be too conservative, as it is based solely on the more reliably datable invention of the armillary sphere by Eratosthenes (*ca.* 275-195 BC). Since the globe is a somewhat cruder invention serving several of the same purposes, it seems reasonable to place its development no later than that of the armillary sphere.

6 Wonderfully clear colour photographs of all surviving globes are to be found in Dekker 2013.

7 On the dating and design of the Farnese globe and its original, see Duke 2006 and Künzl 2005, 63-66.

Manilius and the early history of star charts

globes from the second or third century AD, which are more obviously geared towards a student's needs. The Mainz globe, the more accurate of the two, has a hole through the middle, allowing it to be mounted on a spike (and perhaps also rotated) for easier consultation (see Image 2).⁸ We know from the various mentions of celestial globes in Geminus that they were widely available at least by the latter part of the first century BC: both he and Strabo, soon after, could expect their readers to have at least seen a globe, even if ready access remained a privilege of the few.⁹

Despite the advantages of an easy-to-use scale model of the celestial sphere, globes must have been expensive, and their production a laborious process. Moreover, the weight and bulk of a globe would have made it an impractical companion for a stargazer. As we shall see, it is difficult to say at what point astronomers realised the advantages that flat images could bring to their trade. We shall find that star charts such as are used today may owe a greater debt to the masters of Greek engineering than to the astronomers of the Hellenistic age.

8 We do not hear of fully rotatable globes – that is, ones that could turn on more than one axis – before Ptolemy (*Almagest* 8.3).

9 Geminus, *Introduction to the Phaenomena* 5.35-48; 6.21; 16.10, 12; Strabo, *Geography* 1.1.21.

II. Flattening the heavens

Given the obvious practical advantages of a map over a sphere, one might expect astronomers to have taken a cue from the Hellenistic geographers, who had been producing both globes and maps since the third century BC. However, the contemporary techniques of representing the inhabited world on a plane surface were not sufficiently sophisticated to cope with the needs of celestial topography. Since the known part of the earth covered only a small an area on the terrestrial globe, no significant transformation was required to produce a flat sketch of it.¹⁰ Any astronomer hoping to present all the known constellations had, in contrast, to map out the greater part of a sphere. To achieve this, the astronomer not only had to know the positions of the constellations and major stars on the celestial sphere, but also needed an understanding of stereographic projection, the mathematical technique by which the surface of a sphere is mapped onto a plane. In order, then, to trace the development of the star chart as an alternative to the globe, we must first examine the earliest applications of stereographic projection to astronomy.

The earliest figure to be linked to the projection of the celestial sphere is Hipparchus (ca. 190-120 BC), whom Synesius in the early fifth century AD identified as the pioneer of the procedure. Otto Neugebauer rightly recognised the age of Hipparchus as the likeliest *terminus post quem*: for even though the underlying mathematical knowledge had been available since the previous century,¹¹ Hipparchus was the first astronomer to address problems that could only be solved with a plane image of the

¹⁰ Strabo 2.5.10.

¹¹ Stereographic projection requires no spherical geometry but merely a knowledge of conics, which had already been treated in sufficient detail by Apollonius of Perga in the third century BC.

heavens.¹² On these grounds, subsequent historians have tended to assign Hipparchus a leading role in the development of the star chart.¹³ This, however, is too rash. Even if we can trust the late testimony of Synesius, who wrote in an age when the great achievements of Hellenistic science were already tinged with myth, he claims that Hipparchus ‘spoke cryptically’ (ἠνίξατο) on the subject, suggesting that Hipparchus did not share his method of projection in his writings, but at most alluded to it.¹⁴ Either way, Hipparchus can have offered his successors little help towards the development and use of plane images of the heavens, and almost a century would pass before any real advancements were made in the application of stereographic projection to practical astronomy.

The earliest definite astronomical uses of the projection date to the second half of the first century BC. In his architectural handbook, Vitruvius describes a type of water-clock called an *anaphoricon*, which at any given moment, day or night, could inform its observer of the zodiacal constellation currently rising, as well as any other major constellation north or the ecliptic (*De architectura* 9.8.8-14).¹⁵ This information would be read off a rotating circular disc, onto which was inscribed an image of half the celestial sphere, projected onto the plane of the ecliptic. This had the convenient result that the zodiac, the detail of greatest significance for the clock as a timepiece, lay around the edge

12 Neugebauer 1975, ii.868-70.

13 See most recently North 2008, 98, who suggests Hipparchus as inventor of the astrolabe, or some early form of the device. Also deserving mention here is the equally dangerous assumption that the so-called Timochares planisphere, found in a Byzantine manuscript (Cod. Vat. Gr. 1087) alongside astronomical works by Aratus and Eratosthenes, is of a similar date to the works it accompanies (so, for instance, Eisler 1946, 265-266). There are no grounds for dating this single-projection planisphere any earlier than late antiquity.

14 Synesius, *Ad Paeonium de dono astrolabii* 5.1-3: Σφαιρικῆς ἐπιφανείας ἐξάπλωσιν, ταυτότητα λόγων ἐν ἑτερότητι τῶν σχημάτων τηροῦσαν, ἠνίξατο μὲν Ἴππαρχος ὁ παμπάλαιος, καὶ ἐπέθετό γε πρῶτος τῷ σκέμματι.

15 It is interesting to note that the markings around of the edge of the disc showed the constellations, rather than the *signs*, of the zodiac, which had shifted somewhat on account of precession. The anaphoric clock, therefore, would have been an instrument of little value to the astrologer.

Appendix

of the disc. Fragments of two such clocks have been found in Salzburg and north-eastern France, both dated between the first and third centuries AD.¹⁶ The level of detail on the Salzburger clock is especially striking: its 40-inch face showed not just the principal constellations but also the Equator and Tropic of Cancer (see Image 3). However, the use of this particular projection was not limited to anaphoric clocks: in the Greco-Roman temple of Hathor at Dendera,¹⁷ the ceiling represents the heavens seen from the same perspective, except that the figures represent the Egyptian rather than the Greek constellations.

These projections onto the ecliptic plane mark an important step in the development of the star chart, but cannot themselves be counted as such. For although they offer a clear and reliable flat image of much of the known sky, they omit many important constellations – all those south of the ecliptic – and would therefore be of little use to a student. The projection itself, moreover, is a poor basis for a star map: for even if one were to produce a complementary image to cover the omitted stars (that is, a projection from the north ecliptic pole onto the same plane), most of the zodiac figures would be split in half, with part of each falling on the one map and part on the other. For if an image of the night sky is to be a useful and practical guide, it must cover all the major constellations and obscure as few of their figures as possible. Nevertheless, it is tempting to see the detailed discs of anaphoric clocks as the inspiration for actual star charts. For, as we shall see, there is only a narrow window of time between our first attestation of these clocks – which, as the archaeological record tells us, spread throughout

16 See Benndorf et al. 1903. A persuasive though highly speculative argument has been made for reconstructing an anaphoric clock in the Athenian Tower of the Winds: see Noble & de Solla Price 1968.

17 The most recent dating places the Dendera Zodiac in the 40s BC, taking its evidence from the depictions of Cleopatra VII in the temple. See Buchwald & Josefowica 2010, 340, 377 n. 10.

the Roman world – and the earliest evidence for comprehensive star charts based on a suitable projection.

III. Manilius and the evidence for star charts

In the first book of his *Astronomica*, Manilius leads his reader on a tour through the heavens, describing all the major constellations on his way. In doing so he aligns himself with his influential predecessor Aratus, but does not quite retrace that poet's footsteps. Whereas Aratus appears to have based his route through the stars on the prose handbook of Eudoxus, Manilius takes a very different course through the sky. Beginning with the zodiac, he plots his course through the stars of the northern and then the southern hemisphere, keeping mostly to an eastward bearing. Certain similarities between Manilius' route and the ordering of constellations in Geminus' list have led some to suggest a common source for the two authors.¹⁸ In reality, however, the differences outweigh the similarities. If Manilius had been working from an earlier written source, any deviations he made from it would have required more work than it was worth: since he explains the position of constellations in terms of their neighbouring constellations, even the smallest divergence would require laborious calculation or recourse to a visual model. In fact, out of all the surviving lists of constellations, no two are similar enough to suggest dependence of one upon another, or a common source.¹⁹ It is unlikely, too, that an author such as Manilius based his description on actual autopsy of the heavens, since this would have

¹⁸ So van Wageningen 1921, *ad* 1.263.

¹⁹ See Table 1. The one obvious exception is the Roman translations of Aratus, which generally stay true to the original ordering.

Appendix

required several months of observations. The only reasonable explanation of the discrepancies, as suggested already by Georg Thiele in 1898, is a reliance on a visual model such as a celestial globe.²⁰

There is, however, one detail in Manilius' description that does not sit well with the idea of the poet working from a globe. At 1.433 he makes an unexpected leap from one side of the southern skies to the other, claiming erroneously that the constellation Cetus, the sea-monster, is close to Ara, the altar:

Iuppiter Arae	431
sidera constituit, quae nunc quoque maxima fulget.	
quam propter Cetos convolvens squamea terga	
orbibus insurgit tortis et fluctuat alvo,	434
qualis ad expositae fatum Cepheidos undis	436
expulit adveniens ultra sua litora pontum.	
tum Notius Piscis venti de nomine dictus	
exurgit de parte Noti. cui iuncta feruntur	
flexa per ingentis stellarum Flumina gyros	440

'Jupiter set up the constellation of the Altar, which of all altars shines brightest even now. Next to it Cetus undulates its scaly body; it rises aloft upon a spiral of coils and splashes with such a belly as drove the sea beyond its proper shores when it appeared from the waves to destroy the daughter of Cepheus exposed upon the cliffs. Then rises the Southern Fish in the quarter of the wind after which it is named. To it are joined the Rivers, which make their

²⁰ Thiele 1898, 46-47. Dekker 2013 reaches a similar conclusion from the similarity between Manilius' description of the Milky Way and that offered in the *Almagest*.

Manilius and the early history of star charts

winding way along great curves of stars.’

(1.431-440, omitting the interpolated 435; tr. Goold)

As comparison with Image 5 reveals, the passage’s only apparent error is the placing of Cetus ‘next to’ (*propter*) Ara:²¹ in all other respects, Manilius correctly locates both Cetus and Ara in relation to their neighbours.²² We can therefore rule out the possibility that Manilius has confused Cetus with another constellation or that he was using a poorly designed globe. Given the general reliability of his description in all other details, it is difficult to believe he can have made one single slip in the positioning of Cetus, which one glance at a globe would have revealed as wrong.

If, however, we assume that Manilius was working not from a globe but from star charts such as the one I have reconstructed in Image 5, this supposed mistake makes much more sense. Having already listed the zodiacal constellations in the region of Ara, as well as the nearby Centaurus, Manilius had only one group of constellations left to describe, namely Cetus and its watery neighbours. With no globe-axle blocking his path across the South Pole, Manilius was able to chart a brief and direct course between Ara and Cetus. If we assume the use of a chart, the jump between the two constellations no longer involves a trek around to the other side of the globe, but just a short hop across the Antarctic Circle. With such a chart at his disposal, it will hardly have seemed a stretch to describe the one constellation as near the other.²³ It is inconceivable that he could have said the

21 ‘Next to’ is the only plausible sense of the word *propter* here. Although the *Oxford Latin Dictionary* offers the local senses ‘near, close to’ as well as ‘hard by’, a survey of the attested uses in the *Thesaurus Linguae Latinae* (vol. x (2), 2118-2119) confirms that the local preposition, a near-synonym of *iuxta*, only ever means ‘near, close to’ in the more specific sense of ‘neighbouring’, i.e. with nothing lying in between. Ara, then, could be correctly described as *propter* the constellations Sagittarius or Scorpius, but not *propter* the sea-monster Cetus.

22 The preceding passage (1.415-422) correctly locates Ara next to the Centaur.

23 As Housman pointed out, *contra* (‘opposite’) would have been a more suitable choice of word than

Appendix

same while gazing upon a globe, with the path between the two constellations blocked (travelling longitudinally) by the globe's mount (as in Images 1 & 2) or (travelling latitudinally) by the various intervening constellations around the Antarctic Circle.

Wiser readers will be wondering how much faith to place in my reconstruction of an early star chart, on which the entire argument above depends. In producing the chart, I have endeavoured to limit its contents to things that we know appeared in early graphic representations of the heavens. Its shape and design, also, are modelled on that of an anaphoric clock face, the earliest firmly attested use of stereographic projection – the only significance being the change in the point and plane of projection. For, as explained at the end of the previous section, projection onto the plane of the ecliptic is impractical for star maps, since it obscures the figures of the zodiac. The natural alternative, and the one eventually described in Ptolemy's *Planisphaerium*, is a projection from a celestial pole onto the plane of the equator (see Image 4).²⁴ In order to cover all the known constellations one must carry out two such projections, one for each hemisphere. The reconstruction in Image 5, then, presents only the southern stars: a second chart, covering the northern hemisphere, would have accompanied it.

It was assumed above that the part of the chart representing the antarctic circle would have been left blank, since no Greek or Roman had travelled far enough south to observe the stars around the south pole. But how can we know that the authors of the first star maps did not fill this space speculatively with additional stars? Our best evidence comes from the Farnese and Mainz globes (Images 1 & 2), whose southernmost parts are

propter (Housman 1903-30, vol. i *ad loc.*).

²⁴ See Lorch 1995, 275.

left entirely blank. In the former's case, a small part of the globe is obscured by the figure's shoulders, but the area below the antarctic circle – which is marked on the globe – is otherwise empty. The corresponding part of the Mainz globe is similarly blank: even though the artist included some additional rings of stars for decoration's sake (one of which can be seen in Image 2 directly below *Lepus*), none of this ornamentation strays into the antarctic region.²⁵ Since the first star charts must have been based on globes such as these, it is reasonable to assume that they too featured an empty space around the south pole.²⁶

Perhaps the most striking difference between the reconstructed star chart and its modern equivalents is the perspective from which it presents the sky. Though modern maps and planispheres are produced using the same projection, they present the heavens from the perspective of an earth-based observer (that is, someone 'inside looking out'); anaphoric clock-faces, and presumably, therefore, early star maps too, give the opposite view, showing us the outer face (as it were) of the celestial sphere.²⁷

Although it does not affect the argument above, it is worth noting that the first star maps are likely to have included at least some of the celestial circles. Since anaphoric clock faces as well as globes had markings for the ecliptic, the equator and the tropics, we can safely assume that the early charts did too.²⁸ What is less certain is whether the arctic

25 Tellingly, the artist of the Kugel globe (housed in the Galerie J. Kugel, Paris and roughly contemporary with the Mainz globe) chose not to craft this part of the sphere at all, leaving the globe with a flat base (for photographs see Kugel 2002).

26 Manilius himself may provide yet more evidence for the blank space: for although at 1.443-455 he suggests, by analogy with the North Pole, that two bear-constellations also wheel around the South Pole, he makes no mention of these unseen signs in his actual star-catalogue. It seems, therefore, that he composed the catalogue with the aid of an image which, like all surviving depictions, left out these imagined bears. As George Goold has suggested, the later passage positing the bears is most likely to be 'merely an extempore idea to avoid leaving a blank' (Goold 1954, 132).

27 This, incidentally, is the perspective of the heavens simulated by astrolabes of all ages.

28 My reconstruction also includes the colures, which are marked on all three surviving globes. Their omission from the Salzburg clock is, I suspect, is partly an aesthetic choice and partly motivated by the

Appendix

and antarctic circles were marked, since both the Mainz globe and the Salzburg clock-face omit them. Moreover, any chart-maker wanting his work to be valid for more than one latitude would have had reason to leave out these two variable circles.²⁹

This, then, is the form that the earliest star charts are likeliest to have taken. When Manilius, an otherwise reliable tour-guide, makes the surprising jump from Ara to Cetus, only one explanation is reasonable: that he was plotting his course on a star map.

The *Astronomica* may offer one further piece of supporting evidence for the use of a star map as reconstructed here. At 1.392f. Manilius describes the figure of Orion thus:

at caput Orion excelso immersus Olympo
per tria subducto signatur lumina vultu.

'Three (stars) mark Orion's head, which is imbedded in high heaven with his countenance remote.'

(tr. Goold 1977)

subductus need not mean 'remote, removed'; it can also mean simply 'raised up' (cf. *Subducto vultu* at Prop. 2.10.9). However, that his head is 'imbedded in high heaven' points rather towards the former sense here. This is no trivial distinction, for on the reconstructed star chart, we find that the equator cuts off Orion (visible in the bottom right of Image 5) at the neck. If Manilius is describing his night sky using such a chart, the use of *subductus* here is strikingly apt.

difficulty of calculating their arcs in a projection onto the ecliptic plane.

²⁹ Geminus warns his readers that the markings for these circles on commercially available globes and armillary spheres are only correct for a single latitude (16.12).

Manilius and the early history of star charts

Manilius' first book, written towards the end of Augustus' reign,³⁰ puts the latest possible date for the availability of star maps in the first decade AD. Assigning a *terminus post quem*, however, is rather more difficult. The only evidence of any use is Geminus, who invites his reader at several points to consult a solid globe or armillary sphere, but makes no mention of plane images, even where they could provide exactly the same information as an actual sphere.³¹ Star maps are therefore unlikely to have been widely available until after Geminus; but since his work cannot be dated any more precisely than to between 88 and 36 BC,³² we must settle for a fairly large window in which to place the development and spread of star charts. It is no small step forward, nonetheless, to have found a trace of their use well over a century before their first reliable attestation in Ptolemy's *Planisphaerium*.

With so little other evidence to exploit, I cannot hope for these observations to provoke much further study into the early history of star charts. They do, however, open an interesting avenue of investigation into Manilius' aims as a teacher of astronomy. Composing his work with the aid of star charts, he saw the constellations from the perspective of someone outside the universe looking in – much as we see them when we examine the face of an astrolabe. Many of his ancient readers will have learned the stars from the same perspective, studying them on a chart or on the face of a globe. However, he would have us believe at all times that he is standing at our side, looking out at the stars from the centre of the universe and pointing out each constellation in turn. In an age when

30 According, that is, to the latest and best investigation into the poem's date (Volk 2009, 137-161).

31 For a list of the relevant passages, see n. 9.

32 On the thorny question of Geminus' date, see Evans & Berggren 2006, 17-22.

Appendix

an astrologer could do all his work from almanacs, Manilius was still keen to tempt his students out into the dark and join him in wonder at the night sky.



Image 1. Detail of the Farnese Atlas

National Archaeological Museum, Naples (my photograph).

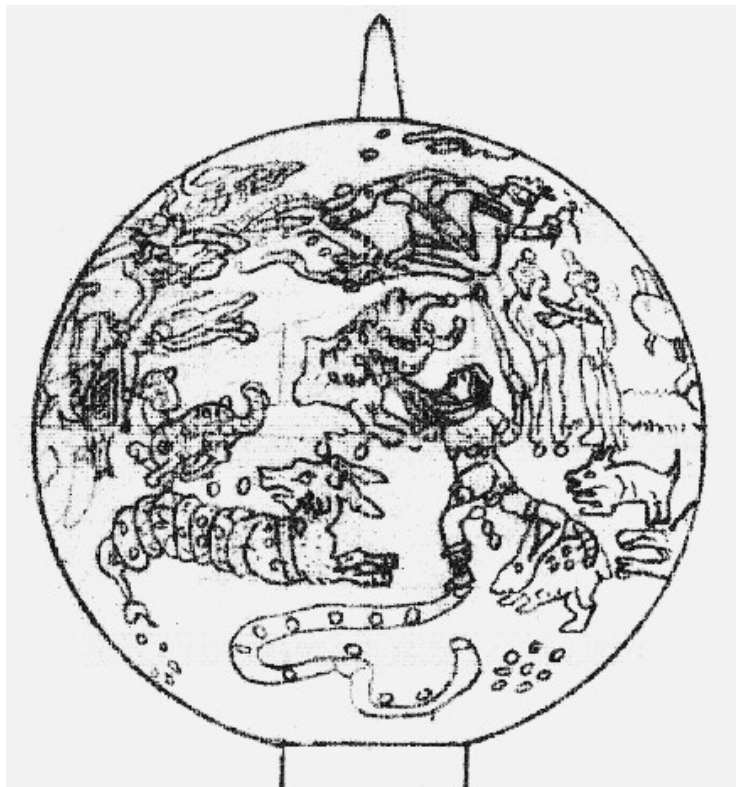


Image 2. Sketch of the Mainz globe, based on an accurate plastic reproduction in the
Römisch-Germanisches Museum, Mainz.

Appendix

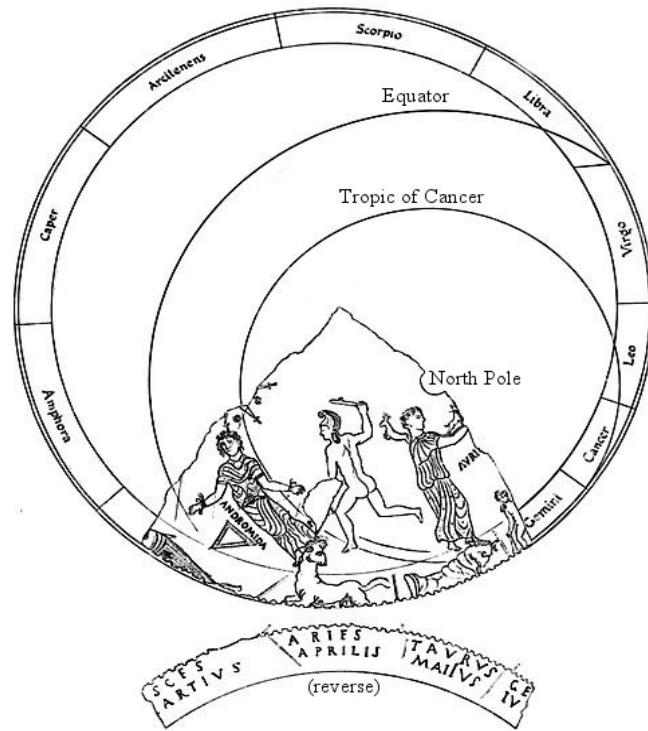


Image 3. Fragment of the Salzburg anaphoric clock (sketch from Benndorf et al. 1903).

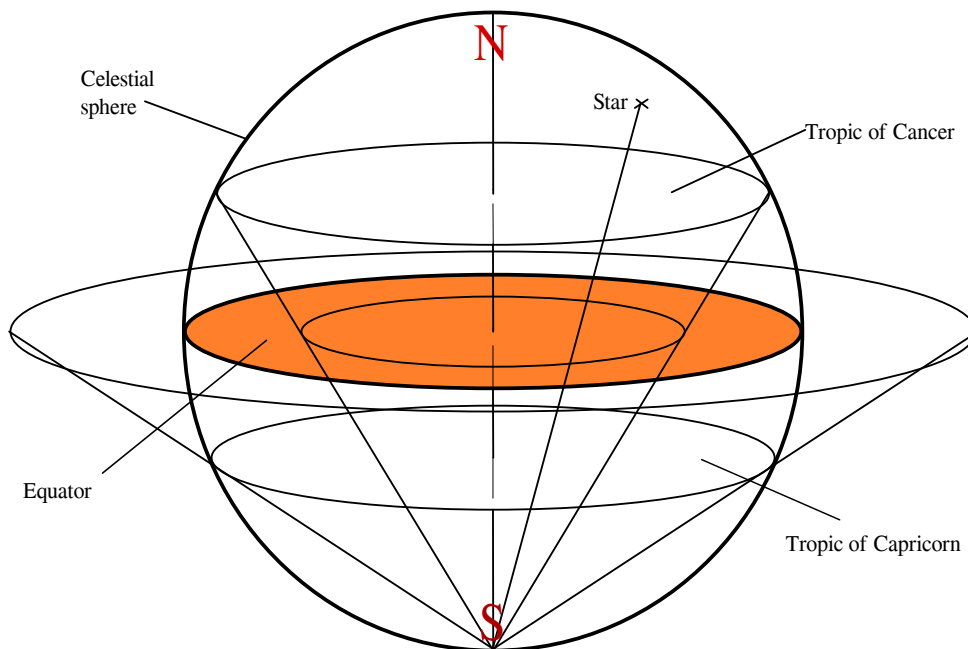


Image 4. The principle of stereographic projection from the South Pole onto the ecliptic.

Manilius and the early history of star charts

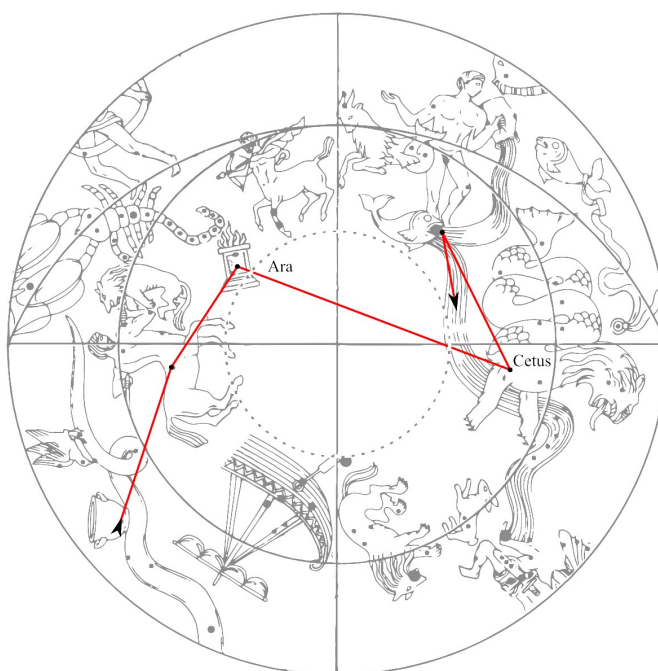


Image 5. Reconstruction of an early star chart, displaying the stars of the southern hemisphere. The red line represents Manilius' course through the last six constellations in his catalogue.

Aratus	Vitruvius 9.3-5	Manilius	Geminus 3.1-15	Ptol. <i>Tetr.</i> 1.9-11	Hyg. <i>De astr.</i> 3
Orion	Piscis Notius	Orion	Orion & Procyon	Piscis Australis	Cetus
Canis	Cetus	Canis & Procyon	Canis	Cetus	Eridanus
Lepus	Ara	Lepus	Lepus	Orion	Lepus
Argo	Centaur, Beast	Argo	Argo	Eridanus	Orion
Cetus	Hydra	Anguis/Hydrus	Hydra	Lepus	Canis
Eridanus	Crater	Corvus & Crater	Crater	Canis	Procyon
Piscis Notius	Corvus		Corvus	Procyon	Argo
Ara	Argo	Centaurus	Centaurus & Lupus	Hydrus	Centaurus
Centaur & Lupus	Canis major	Ara	Ara	Crater	Ara
Hydra	Canis minor	Cetus	Piscis Notius	Corvus	Hydra
Crater	Orion	Piscis Notius	Cetus	Argo	Corvus
Corvus	Lepus	Eridanus	Water of Aquarius	Centaurus	Crater
Procyon	Eridanus		Eridanus	Lupus	Piscis Notius
			Corona Australis	Ara	
				Corona Australis	

Table 1. Orderings of the southern constellations in surviving star-catalogues.

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