

# **Strategies of Defending Astrology: A Continuing Tradition**

by

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## Abstract

Astrology is a science which has had an uncertain status throughout its history, from its beginnings in Greco-Roman Antiquity to the medieval Islamic world and Christian Europe which led to frequent debates about its validity and what kind of a place it should have, if any, in various cultures. Written in the second century A.D., Ptolemy's *Tetrabiblos* is not the earliest surviving text on astrology. However, the complex defense given in the *Tetrabiblos* will be treated as an important starting point because it changed the way astrology would be justified in Christian and Muslim works and the influence Ptolemy's presentation had on later works represents a continuation of the method introduced in the *Tetrabiblos*. Abū Ma'shar's *Kitāb al-Madkhal al-kabīr ilā 'ilm ahkām al-nujūm*, written in the ninth century, was the most thorough surviving defense from the Islamic world. Roger Bacon's *Opus maius*, although not focused solely on advocating astrology, nevertheless, does contain a significant defense which has definite links to the works of both Abū Ma'shar and Ptolemy. As such, he demonstrates another stage in the development of astrology. These three works together reveal the threads of a trend of a rationalized astrology separated from its mythical origins which began with Ptolemy and survived through both medieval Islam and medieval Europe. In the two examples of defending

astrology I have used, Abū Ma‘shar and Roger Bacon, Ptolemy’s influence can be seen to have persisted from the second century through to the thirteenth, and the nature of the differences in their defenses illustrates the continuation and evolution of the tradition of defending astrology.

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# Table of Contents

## Preface

### 1 The Origin of Astrology and its Place in the Sciences

- 1.1 Definition of Terminology
- 1.2 Perceptions of Astrology's Origins
- 1.3 The Reality: Egyptian Astrology
- 1.4 The Reality: Mesopotamian Origins
- 1.5 Babylonian Horoscopes
- 1.6 Astronomical and Cosmological Foundations of Greek Astrology
- 1.7 Greek Divination
- 1.8 The Rise of Greco-Roman Astrology
- 1.9 Determinism
- 1.10 Defending the Sciences
- 1.11 Polemics Against Astrology
- 1.12 Defenses of Astrology

### 2 Ptolemy's Defense of Astrology

- 2.1 Ptolemy's Life and Works
- 2.2 Ptolemy's Philosophy
- 2.3 *Tetrabiblos*
- 2.4 Ptolemy's Defense of Astrology
- 2.5 The Definition of Astrology
- 2.6 Why Practice Astrology?
- 2.7 The Benefits of Astrology
- 2.8 Determinism in the *Tetrabiblos*
- 2.9 Conclusion

### 3 Transmission to the Islamic World

- 3.1 Transmission of Ptolemy's *Tetrabiblos*
- 3.2 Astrology in Early Islam
- 3.3 Conclusion

### 4 Abū Ma'shar's Defense of Astrology

- 4.1 Life and Works
- 4.2 *Kitāb al-Madkhal al-kabīr ilā 'ilm aḥkām al-nujūm*
- 4.3 Reception and Transmission
- 4.4 Abū Ma'shar's Defense of Astrology
- 4.5 Astronomy vs. Astrology - Abū Ma'shar's definition
- 4.6 *Al-qiyās* - Abū Ma'shar's use of comparisons and analogies
- 4.7 The Benefits of Astrology
- 4.8 Determinism in Abū Ma'shar's Astrology
- 4.9 Conclusion of Abū Ma'shar's Defense of Astrology

- 5 The Latin Tradition of Astrology**
  - 5.1 Astrology in the Roman Empire
  - 5.2 The Christianized Empire
  - 5.3 Learning in the Middle Ages: The Encyclopedic Tradition
  - 5.4 Arabic-Latin Translation Movement
  - 5.5 Europe in the High Middle Ages
  - 5.6 Astrology in the High Middle Ages
  
- 6 Roger Bacon's Defense of Astrology**
  - 6.1 Life
  - 6.2 Thought and Works
  - 6.3 *Opus maius*
  - 6.4 Astrology in the *Opus maius*
  - 6.5 Definition and Differentiation
  - 6.6 How Bacon's Astrology Works
  - 6.7 The Benefits of Astrology
  - 6.8 Determinism in Bacon's Astrology
  
- 7 Conclusion**
  - 7.1 Ptolemy as a Source for Astrology
  - 7.2 Ptolemy and Abū Ma'shar: Originality of the Arguments in *Kitāb al-Madkhal al-kabīr*
  - 7.3 Bacon and his Predecessors: The Originality of Bacon's Defense of Astrology
  - 7.4 The Continuing Tradition of Defending Astrology

## **Bibliography**

## **Appendix: Arabic text of *Kitāb al-Madkhal al-kabīr ilā 'ilm aḥkām al-nujūm***

## Preface

The science of astrology has been attested in surviving literature beginning in the Hellenistic period in works such as Geminus' *Isagoge* and Cicero's *De divinatione* and *De fato*. The practice of casting individual horoscopes dates back further, to fifth-century Babylon, while celestial divination in general has been attested at least as early as the second millennium B.C. with the celestial omens found in the *Enuma Anu Enlil*. From these early beginnings, astrology has had a consistent presence in the surviving Greco-Roman, Arabic and Latin literature. Handbooks on astrology, as well as philosophical descriptions of the science, have been translated from Greek into Latin, from Greek into Arabic and from Arabic into Latin. Besides the texts written about astrology, attacks on the science are also present in the literature from Antiquity into the Renaissance. Astrology was popular enough that the astrological texts were often the first translated. It was considered dangerous enough to get the attention of many Christian and Muslim scholars, and astrology has been considered the practical application of astronomy at least from the time of Ptolemy. Clearly, astrology forms an important part of the history of science.

Nevertheless, work on the history of astrology has been slow in progressing, in part, because of a perception well-illustrated by George Sarton when he famously described the information within *The Book of the Zodiac*, a translation of Mandaean texts, as "a wretched collection of omens, debased astrology, and miscellaneous nonsense, ultimately derived from Arabic, Greek, Persian, and all of the superstitious flotsam that was preserved in the Near East."<sup>1</sup> This idea of the history of astrology as being the study of a "wretched subject" has been

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<sup>1</sup>Sarton. 1950, p. 374. For another example of Sarton's dislike of astrology, see his 1954 review of Cramer's *Astrology in Roman Law and Politics in Speculum* 31: 156-161.

summarily dismissed by many historians, beginning with Neugebauer's equally famous reply "The Study of Wretched Subjects" which pointed out the value of studying this so-called pseudoscience. Even in valuable articles such as Anthony Long's 1982 article "Astrology: Arguments pro and contra," we see numerous comments denigrating the practice of astrology, such as his description of Ptolemy's work in the *Tetrabiblos* as "misplaced ingenuity."<sup>2</sup> In contrast, David Pingree, in his 1992 article "Hellenophilia versus the History of Science," states that historians cannot be confined to a modern view of what is science and what is worth studying. It does not matter whether one believes astrology to be true or not. What matters is that those in the past *did* see it as a science and treated it as such.<sup>3</sup>

The Mesopotamian foundations of Greek astrology and the practice of celestial divination have seen a number of works published in the last century. In contrast to the pace of research in Greco-Roman and later astrology, studies of the omen literature have acquired a prominent place in Assyriology. Reiner and Sachs, plus the important research done by Rochberg, have revealed a much larger debt owed by the Greeks than was previously understood. One example is Rochberg's *The Heavenly Writing: Divination, Horoscopy, and Astronomy in Mesopotamian Culture* which addresses not only the history of celestial divination and omen texts but also the historiography of Mesopotamian science.

Even more than a century after its publication, Bouché-Leclercq's *L'Astrologie Grecque* is considered the book on Greek astrology and nothing published since has come close to rendering it obsolete, although it is in need of updating. Thorndike's *History of Magic and Experimental Science* gives another view, although dated, of the practice of astrology, along with

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<sup>2</sup>Long. 1982, p. 187.

<sup>3</sup>Pingree. 1992, p. 559.

other forms of divination and magic, from Antiquity through the Middle Ages. To these tomes can be added a number of volumes with more modest goals. Tester's *A History of Western Astrology* gives a broad introduction to the complicated history of astrology from its beginnings in the Hellenistic period to the Enlightenment. He made no claims to be the final word on the matter but hoped to, in his words, "provide a framework in which to slot new research and knowledge, until it cracks and breaks and becomes first inadequate and then wholly wrong, as it will."<sup>4</sup> In addition to Tester's framework, Barton has also presented two works on astrology: *Ancient Astrology* which is another introductory work and *Power and Knowledge: Astrology, Physiognomics, and Medicine under the Roman Empire*, a book looking specifically at these various practices in Roman times. Cramer's *Astrology in Roman Law and Politics* is another important volume which addresses the place of astrology in the Roman court as well as the varying degrees of acceptance or rejection its practitioners faced within the Roman empire, particularly in Rome itself.

For astrology in later Antiquity and within the Islamic empire, much has been done by Pingree, not least of which is his series of essays *From Astral Omens to Astrology: From Babylon to Bīkāner* as well as his extensive work on the transmission of knowledge from the Greco-Roman world to India, Persia, and the Islamic empire. One example is his article, "The Sabians of Ḥarrān and the Classical Tradition." Kennedy and King, although much of their research has been in astronomy, have also made significant contributions. As more and more Arabic texts are edited and translated, it will be possible to draw better conclusions on the practice and the perception of astrology in Islam. In the Latin West, much of the research on astrology has been focused on the more famous astrologers in the Renaissance, e.g. Ficino and

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<sup>4</sup>Tester. 1987, p. vii.

Cardano, as well as the more vociferous attackers, e.g. Pico della Mirandola. Grafton and Smoller have both contributed important works on Girolamo Cardano and Pierre d'Ailly, respectively. For information on astrology in the early Middle Ages, Flint's book *The Rise of Magic in Early Medieval Europe* does much to fill the gaps as does her article "The Transmission of Astrology in the Early Middle Ages."

One of the many gaps which still remain to be filled within the history of astrology is a thorough examination of the defenses of astrology. Long's article "Astrology: Arguments pro and contra" is still extremely useful even after nearly thirty years, but his presentation ends with Ptolemy's *Tetrabiblos* and commentaries thereon with a brief mention of Firmicus Maternus and St. Augustine in the final few pages. The philosophical tenets of astrology, i.e. determinism and astral influence, posed problems for those who would continue the practice in the Christian and Islamic milieux. Attacks on astrology often focused on this issue as they had in Antiquity, but defenses had to become creative in presenting astrology, which was officially rejected by both Christian and Islamic doctrine, as a valid course of study, worth pursuing even by those who were staunch Christians. When astrology spread beyond the Greco-Roman world to the Middle East and then to Christian Europe, while the foundations stayed the same, the details of how various proponents of astrology defended the practice changed to reflect the culture in which it existed. This work will not answer all the questions which still exist about defenses of astrology and astrology's place within medieval Christianity and Islam; however, by presenting the defenses of two well-known scholars, Abū Ma'shar in ninth-century Baghdad and Roger Bacon in thirteenth-century Paris, an analysis of their methods, the similarities and differences between them, how they compare to Ptolemy's defense in the *Tetrabiblos*, will add to the ever-growing research on this important part of the ancient and medieval sciences. Ptolemy's *Tetrabiblos* is not

the earliest surviving text on astrology. However, the complex defense given in the *Tetrabiblos* will be treated as an important starting point because it changed the way astrology would be justified in Christian and Muslim works and the influence Ptolemy's presentation had on later works represents a continuation of the method found in the *Tetrabiblos*. Abū Ma'shar's defense of astrology as found in his *Kitāb al-Madkhal al-kabīr ilā 'ilm aḥkām al-nujūm* was the most thorough surviving text from the Islamic world. Roger Bacon's *Opus maius*, although not focused solely on advocating astrology, nevertheless, does contain a significant defense which has definite links to the works of both Abū Ma'shar and Ptolemy. As such, he demonstrates another stage in the development of astrology. These three works together reveal the threads of a trend of a rationalized astrology separated from its mythical origins which began with Ptolemy and survived through both medieval Islam and medieval Europe.

## Chapter 1

### The Evolution of Astrology

Definitions of astrology run the gamut from highly specific to highly general. These definitions have gone through changes throughout the history of astrology. It is possible to create a perfectly valid definition of astrology that encompasses any type of belief in astral divination or one so specific that only the modern sense of the stars controlling our actions applies. In the time periods focused on here, i.e. the Greco-Roman tradition which led both to the Arabic and the medieval European interpretations, astrology is the study of presumed correlations between movements, positions, and phenomena of heavenly bodies with mundane circumstances pertaining to individuals and nations, together with a body of predictive practices which are related to this study.<sup>1</sup>

This study required knowledge of how the seven planets of antiquity (Sun, Moon, Mercury, Venus, Mars, Jupiter and Saturn) moved through the zodiac, or the band of stars marking the apparent path of the sun. This band is divided into the twelve signs of the zodiac which roughly correspond to the constellations populating that region of the sky. The location of these signs in the sky is as important as the location of the planets. The zodiac is divided into twelve houses beginning with the sign rising on the eastern horizon, called the ascendant or the *horoscopus*, which is one of the four cardines. The other three cardines are midheaven, or the highest point on path of the zodiac, the descendant, or the western horizon, and lower midheaven, which is the lowest point on the path of the zodiac and is opposite of midheaven. The

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<sup>1</sup>Clearly, this definition is not one put forward explicitly by any of the ancient authors, per se. The boundaries between astronomy and astrology were often blurred and even the terminology overlapped as discussed below. However, in terms of the texts which will be analyzed in later chapters, this definition encapsulates the main divisions of astrology: genethliological or horoscopic, catarchic, historical and interrogational.



signs of the zodiac themselves were also divided into smaller pieces which would allow for ever more precise predictions based on the location of the planets within them.

Within the study of the history of astrology, there has been a long-standing debate about the validity of the practice in general, as well as its place in the hierarchy of science *and* its inclusion or exclusion from religious practice, in particular the place of determinism as one of the tenets of astrology. This debate took the form of texts written for and against astrology and spans the time from the second or third century B.C. (and earlier if references found in works by Geminus and Cicero are accurate) through the Middle Ages and well into the Renaissance and Early Modern periods.<sup>2</sup> Attacks on astrology focused on demonstrating that the practice had no validity and used arguments such as lack of accuracy, problems with determinism, fraudulent practitioners and comparisons with other equally-disparaged practices. Defenses often relied on the use of historical examples of successful predictions, obvious instances of celestial influence such as seasons and tides, and also comparisons with popular practices like medicine and navigation. The uncertain position of astrology as a science led to the publication of numerous defenses in Antiquity and the Middle Ages. Few directly addressed the specific attacks, but the strategies employed to defend it generally involved responses to stock arguments.

### **1.1 Definition of terminology**

In understanding astrological attacks and defenses, the first necessity is to define what is meant by the term *astrology*. How does it differ from its sister science astronomy? *Did* it differ from astronomy in the past? What are its origins, its tenets? Answers to these questions begin with a brief look at the terms used for astrology within ancient and medieval texts.

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<sup>2</sup>In addition, although outside the scope of this study, there are also modern-day attacks and defenses of the practice of astrology, e.g. the 1973 book by Bok and Jerome and Phillipson's 2003 article, both of which demonstrate the continuation of the debate.

The use of the term *Astrology* referring to a specific scientific practice was by no means settled in Antiquity, nor even in the Middle Ages. Hübner, in his *Die Begriffe "Astrologie" und "Astronomie" in der Antike*, points out that the title of Martianus Capella's eighth book has switched back and forth between *De Astrologia* and *De Astronomia* in editions which came out between the late fifteenth and nineteenth centuries.<sup>3</sup> The usual Greek terms used in speaking of the practice of astrology as defined above were γενεθλιακή, which referred specifically to nativity astrology, and ἀποτελεσματική, while the common Latin terms were *mathesis* and *mathematicus* for the practice itself.<sup>4</sup> When the terms *astrologia* and *astronomia* were used, it appears that they were interchangeable. Looking at specific authors, we can see the obvious differences in terminology. In Ptolemy's *Tetrabiblos*, astrology is a type of prognostication which he defines as one of the "means of prediction through astronomy"<sup>5</sup> or "that in which by means of the natural character of these aspects themselves we investigate the changes which they bring about in that which they surround." The word *astrologia* is not found in the *Tetrabiblos*. Instead, Ptolemy calls it "prognostication through astronomy."<sup>6</sup> The translation of the Arabic phrase as found in Abū Ma'shar's *Great Introduction to Astrology* is "the science of the judgments of the stars"<sup>7</sup> although astrology was not explicitly separated from astronomy until the tenth century.<sup>8</sup>

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<sup>3</sup>Hübner. 1989, pp. 5-6.

<sup>4</sup>Hübner. 1989 pp. 6-8.

<sup>5</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, 1.1.

<sup>6</sup>Ptolemy/Robbins (trans.). *Tetrabiblos* 1.3. The Greek phrase is τὸ δι' ἀστρονομίας προγνωστικόν.

<sup>7</sup>Abū Ma'shar. *Great Introduction to Astrology*, title page. The Arabic phrase is 'ilm al-ḥikām al-nujūm. All translations are mine unless otherwise indicated. For the Arabic text, see Appendix I.

<sup>8</sup>The Arabic term for astronomy is 'ilm al-hay'a.

Roger Bacon does use the Latin *astrologia* in his *Opus maius*, but even there, it is not common, showing up only a handful of times in Book IV and *astrologer* only in a quotation from the *Centiloquium*. Instead, Bacon uses *astronomia* and *astronomer* to refer to those who practice astrology. From those who rejected astrology in antiquity, we can see that *astrologia* has a different meaning. For example, Sextus Empiricus in his work *Against the Professors*, devotes one of his books to a rejection of astrology. In the first lines of that book, he rejects the use of the term *astrologia/astrologos* to refer to the practice and the practitioners, claiming that they took on the titles of *astrologoi* or *mathematikoi* to make themselves sound more important.<sup>9</sup> Because of the fallacy of the practice, Sextus Empiricus refuses to address them by that title, instead using the term *Chaldeans*. In addition, he does not call what they do *astrologia*. With two exceptions (at V.92 and V. 104) in every case, although Bury translates it as *astrology*, Sextus uses the term *Chaldaïke* to describe astrology.<sup>10</sup> In each example, whether it is being attacked or defended, astrology is a practice which deserved serious consideration, and regardless of the term used to describe it, the Classical and medieval meaning of astrology was applied astronomy, or the use of the stars to predict the course of human events, and as will be seen, the assumption is that the stars themselves are the causes, rather than the messengers.

## 1.2 Perceptions of Astrology's Origins

In addition to the wide variety of terms used to refer to astrology, within the Greco-Roman tradition, there is also an inconsistency in the perception of the origins of astrology. Neither the Greeks nor the Romans claimed the privilege of being the founders of astrology, but

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<sup>9</sup>Sextus Empiricus/Bury (trans.). *Against the Astrologers*, V.2.

<sup>10</sup>See, for example, V.43, 45, 49, and 50, and throughout, *Chaldaioi* is used in place of *astrologers*.

they were inconsistent in laying credit (or blame) on one group. In Antiquity, it was common to cite the ancients as the source of knowledge. Various writers attributed the tenets of astrology to either the ancient Egyptians or to the Chaldeans, sometimes both, which, as Bouché-Leclercq notes, makes discovering the actual paths of transmission that much more complex.<sup>11</sup>

One example of attributing the origins of science in general to the ancient Egyptians can be found in Aristotle's *Metaphysics*. In Book I, Aristotle's explanation of the founding of all the sciences is that it requires the existence of leisure. The priests of Egypt, in his view, were the founders of all the mathematical sciences because they had the opportunity to devote time to study.<sup>12</sup> Bouché-Leclercq gives a list of authors who looked to the Egyptians as the founders of astrology which includes Diodorus, Diogenes Laertius, Manilius, and Firmicus Maternus, among others.<sup>13</sup>

Later attributions often took the form of citing Nechepso and Petosiris as the authors passing on their knowledge. Nechepso is the name of a king in Egypt in the seventh century B.C. while Petosiris could be referring to a number of figures in Egyptian history. Pingree notes that the most famous attribution would be that of a priest of Thoth in the third century B.C.<sup>14</sup> A number of fragments of works attributed to Nechepso and Petosiris survive although the texts can only be dated back to the second century B.C. Regardless, for many ancient scholars, these two figures represented the ultimate mortal sources for the practice of astrology. The first century A.D. Roman astrologer, Manilius, ascribed the ultimate origins of astrology to the god Mercury,

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<sup>11</sup>Bouché-Leclercq. 1899, p. 51.

<sup>12</sup>Aristotle/Irwin and Fine (trans.). *Metaphysics* I.1.

<sup>13</sup>Bouché-Leclercq. 1899, p. 51, note 1.

<sup>14</sup>Pingree. 2008, p. 547.

but thereafter refers to “kings whose minds reached out to heights bordering on heaven, kings who civilized savage peoples beneath the eastern sky” and to “priests who all their lives offered sacrifice in temples and were chosen to voice the people’s prayer secured by their devotion the sympathy of God.” While not of certain appellation, Goold believes it is possible that the reference to priests could be an allusion to Petosiris.<sup>15</sup> More certain references are found in later works. In Book VII of his *Natural History*, Pliny the Elder makes a brief reference to the “Theory of Quarters” as a method of determining chronology and says that it was “handed down by Petosiris and Necepsos.”<sup>16</sup> Vettius Valens, a practicing astrologer contemporary with Ptolemy, endowed Nechepso and Petosiris with nearly-divine qualities, specifically in Book VI, stating that Nechepso had “left behind all that was earthly whereupon he was able to walk among the stars.”<sup>17</sup> Although not going so far as to deify the Egyptians, Firmicus Maternus, in the A.D. fourth century, often cited Nechepso and Petosiris as major sources of the tenets he was revealing to Mavortius, describing them as “divine men, altogether worthy and admirable, Petosiris and Nechepso, who approached the very secrets of divinity.”<sup>18</sup>

In contrast, there are as many authors attributing the origins of astrology to the scholars of Mesopotamia. Cicero, in his work *De divinatione*, cautions Quintus against believing in astrology saying that they should “scorn the Babylonians, too, and those astrologers who, from the top of Mount Caucasus, observe the celestial signs and with the aid of mathematics follow the courses

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<sup>15</sup>Manilius/Goold (trans.). *Astronomica* I.40-48. Goold notes that the mention of eastern kings could be a reference to Zoroaster and Belus, but in the context, Nechepso, known as a king of Egypt, could be an equally valid interpretation particularly since it is linked to the priests.

<sup>16</sup>Pliny the Elder/Rackham (trans.). *Natural History* VII.160.

<sup>17</sup>Komorowska. 2004, pp. 160-161. See also, Vettius Valens/Pingree (ed.). *Anthologiae* VI.1.8.

<sup>18</sup>Firmicus Maternus/Bram (trans.). *Mathesis* III Proe.

of the stars”<sup>19</sup> although he later describes the Chaldeans as “preeminent in their knowledge of the stars and their quickness of mind.”<sup>20</sup> This, he says, is because of their geographical location. The wide open view of the sky found in Egypt and Babylon allowed them to focus on and develop astrology.<sup>21</sup>

Like attributions to the ancient Egyptians, there exists a tradition for the transmission of astrology via one particular scholar. This tradition is not as widespread as that of Nechepso and Petosiris but can be found in the recognition of the existence of interactions between the Mesopotamian and Greco-Roman worlds. For example, Vitruvius places the transmission of astrology from Babylon to Greece squarely on the shoulders of Berossus of Cos, a Babylonian priest from the third century B.C. who wrote a text, the *Babyloniaca*, in Greek in an effort to describe his culture to the Greek world.<sup>22</sup> The fragments which have survived show little astrological content but do include a reference to the Great Year. Its surviving astronomical content is a short discourse about the moon. Both elements are in the fragments of Book I. Pliny the Elder also mentions Berossus in Book VII, claiming that “on account of his marvellous predictions Athens officially erected in the exercising ground a statue with a gilt tongue” and that he and Critodemus both asserted that the Babylonians had 490,000 years worth of astronomical observations recorded.<sup>23</sup> In addition, in Book IX of his work *On Architecture*, Vitruvius attributes the knowledge of casting nativities to the “men of genius and great acuteness who sprang directly

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<sup>19</sup>Cicero/Falconer (trans.). *De divinatione* I.36.

<sup>20</sup>Cicero/Falconer (trans.). *De div.* I.91.

<sup>21</sup>Cicero/Falconer (trans.). *De div.* I.93.

<sup>22</sup>Burstein. 1978, pp. 5-6. See also Bouché-Leclercq. 1899, pp. 36-37.

<sup>23</sup>Pliny the Elder/Rackham (trans.). *Natural History* VII.123, 193.

from the nation of the Chaldeans. First of all, by Berossus who settled on the island state of Cos and there opened a school.”<sup>24</sup> In addition to Berossus, Greek writers referenced other Chaldean scholars who also were credited with introducing various parts of astrology. Among them are Soudines, Kidenas and Naburianos, all described as Chaldeans or students of the Chaldeans. Cumont mentions Kidenas, in particular, as one credited with the discovery of the period of the lunar anomaly used by Hipparchus.<sup>25</sup> In fact, Vettius Valens, in his *Anthologiae* states that he looks to Kidenas and Soudines (along with Apollonius) for information about the Moon, rather than to Hipparchus to whom he turns for information on the sun.<sup>26</sup> Pliny the Elder references Kidenas and Sosigenes as scholars who studied the movements of Mercury, noticing that it never moved more than twenty-three degrees from the sun.<sup>27</sup>

Perhaps the most obvious indication of the Greco-Roman world’s awareness of the Babylonian origins lies in the common title for astrologers found in many texts: the Chaldeans. Historically, the Chaldeans were the rulers in Babylon in the period preceding the Persian conquest. In Greco-Roman texts, however, the term became synonymous with astrology containing little association with the Babylonian rulers. One of the earliest uses of “Chaldean” in association with astrology is found on an inscription at Larisa in Thessaly. One of the four inscriptions honors a man by the name of Antipater, a native of Syria, who was called a Χαλδαῖος ἀστρονόμος.<sup>28</sup> Bowersock associates this Antipater with the man mentioned in

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<sup>24</sup>Vitruvius/Morgan (trans.). *On Architecture* IX.6.2.

<sup>25</sup>Cumont, Franz. 1909, pp. 162-164.

<sup>26</sup>Vettius Valens/Pingree (ed.). *Anthologiae* IX.11, p. 339.

<sup>27</sup>Pliny the Elder/Rackham (trans.). *Natural History*, II.39.

<sup>28</sup>Gallis. 1980, pp. 250-251.

Vitruvius' *De architectura* who followed in the tradition of Berossus of Cos.<sup>29</sup> This appellation is found in the works of Geminus, Cicero, Sextus Empiricus, and Ptolemy. As was noted above, Sextus Empiricus called astrology the art of the Chaldeans, refusing to dignify it with the title of astrology.<sup>30</sup> Cicero, also, often uses the term *Chaldean* to describe the practitioners as well as the art which they practice. In introducing his section on astrology, Cicero calls the practice “Chaldaeorum monstra” or the “Chaldean manifestations” and subsequently describes the “Chaldean method of foretelling the future,” the “prophecies of the Chaldeans” and repeatedly refers to those making predictions as Chaldeans.<sup>31</sup>

Finally, it should be noted that not all scholars were firmly aligned on one side or the other. Many spoke of both the Egyptians *and* the Babylonians as being the sources for the beginnings of astrology. For example, Firmicus Maternus describes the knowledge he will share with Mavortius as being “what the Egyptian sages and Babylonian priests, who are so knowledgeable about the force of the stars, have handed down to us in their teaching about astrology.”<sup>32</sup> Pliny the Elder speaks equally of Berossus and of Nechepso and Petosiris in his *Natural History*. Cicero, although he uses the term *Chaldean* and seems aware of the origins of the word, saying that the name comes from the race of people who practiced it rather than from the art itself, still mentions that there are some who claim that the Egyptians acquired the same art “through a remote past extending over almost countless ages.”<sup>33</sup>

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<sup>29</sup>Bowersock. 1983, p. 491.

<sup>30</sup>E.g. Sextus Empiricus/Bury (trans.). *Adversos Mathematicos* V.45, 50, 82.

<sup>31</sup>Cicero/Falconer (trans.). *De div.* II.87, 88, 89-99.

<sup>32</sup>Firmicus Maternus/Bram (trans.). *Mathesis* I.6.

<sup>33</sup>Cicero/Falconer (trans.). *De div.* I.2.



Thus, there is little consensus among the ancient scholars for the origins of astrology. Piecing together the reality is nearly as complex.

### **1.3 The Reality: Egyptian astrology**

While it was common to attribute to the ancient Egyptians the origin of scientific thought and the source of culture, the surviving sources for the history of astrology tell a different story. Texts from various periods of Egyptian history show an astronomy steeped in the religion of the civilization. While many astrological papyri have been discovered, they date to the Roman period. In fact, Alexander Jones notes that “no known astronomical papyrus antedates the Macedonian conquest of Egypt.”<sup>34</sup> Neugebauer and van der Waerden both dismiss the possibility of much influence coming from Egypt in either astronomy *or* astrology. The pieces of Egyptian astrology which have been found all seem to have been influenced by either Greek or Babylonian antecedents, including the famous Dendera zodiac.<sup>35</sup>

This dismissal does not eliminate any sort of influence coming from indigenous Egyptian traditions, however. While the lack of Egyptian astrology and astronomy before the Hellenistic era is well-known, equally well-known is the Egyptian origin for the use of decans in astrology. For the Egyptians, the decans functioned as an approximate method for measuring time during the night, but this division of a band of stars used to determine the hours of the night, was later used in Hellenistic astrology as thirds of the zodiacal signs. For the Egyptians, according to Neugebauer and Parker, the decans initially “indicate (by their risings as we shall see) either intervals or dividing points. In other words, each decan consists of a well-defined group of stars which require exactly one hour to rise, or of a single star which, when it appears on the horizon,

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<sup>34</sup>Jones. 1999, p. 301.

<sup>35</sup>See Neugebauer. 1943, p. 121 and van der Waerden. 1953, pp. 228-229.

indicates the end of one hour and the beginning of the next.”<sup>36</sup> These decans have been seen on coffins, some of which have been dated back as early as the third millennium B.C., as well as on papyri and ceiling texts.<sup>37</sup>

In addition to the direct contributions, Egypt appears to have played the role of intermediary between Mesopotamia and ancient Greece. Hemerology, the practice of determining whether each day of the year would “bring good or ill fortune to businesses or persons” was a task which was allotted to the “hour-priests” in the pharaonic period. This should not be confused with astrology because the use of the stars was only pursued to help with the measurement of calendrical time and was founded on Egyptian mythology, not on the movements of the stars.<sup>38</sup> However, this tradition does open up the possibility that the Egyptian priests incorporated astrology into their practice as Mesopotamian texts were transmitted to Egypt. While the earliest Egyptian horoscope only dates back to 37 B.C., Dieleman presents the case of Harkhebi, a second-century B.C. priest whose abilities are honored in an extant inscription, which gives some idea of the extent to which the priesthood was involved in astrology during this time period.<sup>39</sup> The inscription describes Harkhebi as an expert in both medicine and astronomy, and most significantly, he calls the planets, “the gods who foretell the future.”<sup>40</sup> While this should not be taken as an illustration of Hellenistic astrology, it does show a shift in the perception of what role the stars play. Dieleman is quick to note that Harkhebi was not casting horoscopes, but it is likely

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<sup>36</sup>Neugebauer and Parker. 1960, p. 96. For a summary of Egyptian astronomy, see also, Parker. 1974, pp. 51-65.

<sup>37</sup>Neugebauer and Parker, *EAT*, vols. 1 and 2.

<sup>38</sup>Dieleman. 2003, pp. 138-139.

<sup>39</sup>Dieleman. 2003, p. 142.

<sup>40</sup>Dieleman. 2003, p. 143.

that Mesopotamian texts influenced the practice of the Egyptian priesthood who were “not at all reluctant to incorporate the new art into its traditional field of knowledge” and possibly functioned as a source of transmission of astrological knowledge.<sup>41</sup>

In general terms, both the 24-hour division of the day and the 365-day year can be attributed to the Egyptians and they likely functioned as intermediaries for astrological ideas, but direct astronomical and astrological influences on the Greco-Roman world are confined to the contribution of the decans, which were greatly modified from telling the hours of the night to a division of the signs of the zodiac.

#### **1.4 The Reality: Mesopotamian Origins**

In stark contrast to the limited influence of Egyptian scholars on Greco-Roman astrology, the impact of ancient Mesopotamian astral divination and the detailed observations which were transmitted to Greek astrologers seem to be instances of genuine influence. The use of technical aspects such as the zodiac and the evolution of the Babylonian horoscopes, plus the terminology puts some level of borrowing beyond doubt. As Campion claimed, the question is not *whether* Greek astrology owes something to the Babylonians. “What is at issue is the extent to which they innovated, and what aspects of its technical and philosophical baggage they rejected or adopted.”<sup>42</sup>

Historians generally place the origins of astrology within Mesopotamia and the omen literature. Although omen texts, such as the *Enuma Anu Enlil*, and the earliest extant copies of the astronomical work, MUL.APIN, do not contain the type of information normally defined as astrological in the classical sense, within them, we can see such common threads as the position

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<sup>41</sup>Dieleman. 2003, p. 151.

<sup>42</sup>Campion. 2000, p. 538.

of planets indicating certain outcomes and the importance of the zodiac.<sup>43</sup> Even so, the omen texts should not be confused with astrology as defined above. These texts do not contain the philosophical foundation of astrology, i.e. that the stars somehow dictate the fate of mankind. Rather, they are the signs of the gods, revealing the future to mankind, sometimes with the intention of allowing them to avoid negative events. In addition, the *omina* were not intended to predict the futures of individuals. They were warnings given by gods who “were viewed as the ultimate causes of the ominous occurrences as well as the authorities behind the texts in which the omens were compiled.”<sup>44</sup> This opened up the possibility of changing the outcome through the use of the so-called “apotropaic” rituals. Unlike the fatalistic brand of astrology which was to appear in later centuries in the Greek-speaking world, this method of divination did not require a complete capitulation to the whims of the gods. To be sure, there was a possibility that nothing could avert the coming catastrophe, but it was not a certainty. A collection of these texts, the *Astrological Reports to Assyrian Kings*, shows the variety of predictions given by the astrologers to the king.

Mars, which stan[ds] inside Scorpius, is about to move out; until the 25<sup>th</sup> of [Tammuz (IV)] it will move out of Scorpius and its radiance is fallen. Let the king my lord be happy; the king should be very glad, (but) until (Mars) goes out, let the king guard himself. (ARAK 387)<sup>45</sup>

As a warning, the idea is that once Mars has moved out of Scorpius, the king will be well but not until then. In the following omen, the focus is again on the land and the nation (cattle, fields, women of the land) as opposed to focusing on a specific individual, although the king himself is

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<sup>43</sup>The earliest extant copies of both texts date back to the early first millennium B.C., from Assyrian sources. Campion suggests that both were compiled in the second millennium. See Campion. 2000, p. 520.

<sup>44</sup>Rochberg. 2004, p. 4. See also, Swerdlow. 1998, p. 3.

<sup>45</sup>Hunger (ed.). 1992. *Astrological Reports to Assyrian Kings*, p. 222. Dated to 666 B.C.

mentioned.

If the moon is surrounded by a halo, and Mars [stands] in it: fall of cattle and of animals of [the steppe]; the cultivated field will not prosper; ... will diminish.

If a star stands in the halo of the moon: the king and [*his*] troops will be *shut up*. Mars is the star [...].

If the moon is surrounded by a halo, and the Pleiades stand in it: in Iyyar (II) pregnant women will give birth to male children; the king of the world's land will defect from him and... [...]. (ARAK 376)<sup>46</sup>

Unlike later astrology the omen literature reveals a system in which the gods put signs in the heavens for the benefit of the people with the result that they will be able to avoid the coming event.<sup>47</sup> It would not be until the fifth century B.C. that there was a shift away from kings and nations to the future of the individual.

Having shown how different Babylonian divination is from later Greco-Roman astrology, why is it called the forerunner of the science? No matter the philosophical underpinnings, it is clear that certain technical elements of astrology have their origins in Babylonian divination. For the purpose of the arguments, a single example will illustrate the fact of transmission from Babylon to Greece if not the actual process of that transmission.

One of the most important parts of casting a nativity is determining the placement of the signs of the zodiac. The twelve signs form the foundation for horoscopic astrology. The composition of the zodiac with its twelve familiar signs can be traced to Babylonian divination as a method of measurement, locating the planets as they moved through the sky.<sup>48</sup> For example, in Hunger and Pingree's translation of MUL.APIN, the sun and moon are located in the heavens relative to constellations on a specific day: "On the 15<sup>th</sup> of Tešritu the Sun rises in the Scales in

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<sup>46</sup>Hunger (ed.). 1992, p. 213. This particular report is undated; however, Hunger has dated other reports by Nabû-šuma-iškun to the 670s B.C.

<sup>47</sup>Rochberg-Halton. 1990, p. 28.

<sup>48</sup>Campion. 2000, p. 531.

the East, and the Moon stands in front of the Stars behind the Hired Man.”<sup>49</sup> In *MUL.APIN*, which dates to the first millennium B.C., there is a list of seventeen constellations through which the moon and planets pass during their rotations.<sup>50</sup> These constellations, though marking a lunar path rather than a solar path, are a clear early stage of the now-familiar twelve-sign zodiac which marks the paths of the seven heavenly bodies. Within the following list, many of the signs are equivalent to those of the modern zodiac.

The gods who stand in the path of the Moon, through whose regions the Moon in the course of a month passes and whom he touches: The Stars, the Bull of Heaven, the True Shepherd of Anu, the Old Man, the Crook, the Great Twins, the Crab, the Lion, the Furrow, the Scales, the Scorpion, Pabilsag, the Goat-Fish, the Great One, the Tails, the Swallow, Anunitu, and the Hired Man.<sup>51</sup>

By the fifth century B.C., the twelve-sign zodiac was attested in Babylonian texts, and Steele demonstrates how even some of the less familiar signs such as HUN, the Hired Man, and Pa, Pabilsag, have influenced the signs of the Greek zodiac. Pabilsag is a god from the Kassite period in the second millennium B.C. who is depicted on a boundary stone as a centaur shooting an arrow, just as Sagittarius does within Greek zodiacal imagery. Similarly, although less obviously, the Hired Man is associated with Aries the Ram. Steele follows Urgrind, Wallenfels and Foxroge in ascribing the shift to a form of cuneiform punning.<sup>52</sup> By the late fifth century, the seventeen constellations listed above had been whittled down to the twelve signs used in Greek astronomy

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<sup>49</sup>Hunger and Pingree (ed. and trans.). *MUL.APIN: An Astronomical Compendium in Cuneiform*, pp. 73-74.

<sup>50</sup>Hunger and Pingree (ed. and trans.). *MUL.APIN*, p. 67.

<sup>51</sup>Campion. 2000, p. 532 for the constellations and their modern day equivalents. See also Hunger and Pingree (ed. and trans.). *MUL.APIN*, pp. 67-69.

<sup>52</sup>See Steele. 2006, p. 154-156.

in the fourth century B.C.<sup>53</sup>

It is also in this period in Mesopotamia that we see the use of zodiacal *signs* as opposed to constellations in order to locate the planets, i.e. the use of twelve equal thirty-degree divisions of the ecliptic rather than the twelve constellations of varying sizes.<sup>54</sup> John Britton looked at the extant texts from the fifth and fourth centuries B.C. and discovered a gradual shift from the use of genuine constellations to signs. The creation of the signs posed a problem for the Old Babylonian scholars, particularly those signs that are especially long, specifically Taurus, Leo and Aquarius, and those that are short such as Cancer and Virgo. The longer constellations would run into other signs while the shorter constellations would leave gaps.<sup>55</sup> In creating signs which were generally aligned with the constellations after which they were named, one of the most important considerations appears to be the need to keep the Pleiades and the star ζ-Tau within Taurus.<sup>56</sup> In contrast to van der Waerden's date of mid-fifth century B.C. for the introduction of the zodiac, Britton prefers a later date of around 400 B.C. based on reports of planetary positions. Extant reports prior to 408 B.C. refer to stars and constellations, not signs, while references to zodiacal signs begin to appear in the literature in 396 B.C. with an evidentiary gap between those years, and it is possible that the use of zodiacal signs was, in part motivated by the introduction of horoscopes.<sup>57</sup>

That the Greek-speaking world had extensive contact with the Middle East is not in

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<sup>53</sup>Van der Waerden. 1953, pp. 217, 225.

<sup>54</sup>Rochberg. 2004, p. 131.

<sup>55</sup>Britton. 2010, pp. 633-637.

<sup>56</sup>Britton. 2010, p. 638.

<sup>57</sup>Britton. 2010, pp. 640-645, 649.

dispute. From trade routes to the Persian Wars to the conquests of Alexander the Great in the fourth century, it is clear that the Greeks were aware of and had interactions with the people of Mesopotamia and its surrounding environs. Van der Waerden notes that, unlike its Babylonian counterpart, the Greek zodiac appears to have resulted, not from a gradual evolution, but from some sort of appropriation. Hipparchus claimed that Eudoxus, in the fifth century B.C., divided the ecliptic into equal zodiacal signs, but Bowen and Goldstein question the reliability of Hipparchus' evidence.<sup>58</sup> Hipparchus interpreted Aratus' third-century B.C. *Phaenomena* to be references to signs, but Aratus only recognized the existence of zodiacal constellations, instead of signs. However, he does not divide the constellations into degrees.<sup>59</sup> Both Autolycus, in his *De orbitibus*, and Euclid, in his *Phaenomena*, divided the ecliptic into twelve equal arcs. The earliest occurrence of dividing the zodiacal circle into 360 degrees is found in Hypsicles' *Anaphoricus* from the second century B.C.<sup>60</sup> Although there is evidence for much earlier use in Babylonian texts, the Papyrus Hibeh 27, dated to around 300 B.C., is the earliest extant Greek text using equinoctial hours to divide the day.<sup>61</sup> The exact time and method is uncertain, but by the second century B.C., both the ecliptic *and* the zodiac were commonplace in Greek scientific texts.

It is clear that technical elements of astrology have their origins in Mesopotamian divination and omen texts, but what about the practice of astrology itself? How did celestial divination shift from messages between gods and nations to the influences of the heavens on the lives of individuals from birth to death no matter their station? Again, the exact method is

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<sup>58</sup>Bowen and Goldstein. 1991, p. 241.

<sup>59</sup>Bowen and Goldstein. 1991, p. 243.

<sup>60</sup>Bowen and Goldstein. 1991, pp. 246-247.

<sup>61</sup>Bowen and Goldstein. 1991, p. 239. See also Neugebauer. 1972, p. 246.



unclear and the debate continues as to whether practices in Mesopotamia should be defined as astrology or if they represent a type of astral divination which should be separated from Greco-Roman astrology.

### 1.5 Babylonian Horoscopes

Babylonian omen texts were signs given by the gods to warn of potential dangers or indicate coming blessings. The other important difference is that, except when foretelling events affecting the king, omens were not given for individual lives. Rather, the *omina* referred to the fate of the land, e.g. that “the harvest of the irrigated land will prosper, the land will be happy.”<sup>62</sup> Even those omens read for the king often affected the land as well, e.g. that “Adad will bring his rains, Ea his floods, king will send messages of reconciliation to king. There will be hostilities in the land.”<sup>63</sup>

It was not until the fifth century B.C. that the first Babylonian horoscopes appear in the source material. Pingree ascribes this gradual shifting focus to the need of diviners to find new clients as the native rulers gave way to the Macedonian and Parthian invaders.<sup>64</sup> This shift had more than one effect on Babylonian divination. Not only did it shift the focus from the nation to the individual, but, Rochberg speculates that it also shifted the practice from divinatory to computational, i.e. from a method of communicating with the gods to calculations of the movements of the heavenly bodies,<sup>65</sup> which is more in line with astrology as practiced in the Greco-Roman world. The translation by Sachs of a horoscope from the Seleucid Era shows the

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<sup>62</sup>Rochberg. 2004, p. 76.

<sup>63</sup>Rochberg. 2004, p. 76.

<sup>64</sup>Pingree. 1997, p. 19.

<sup>65</sup>Rochberg. 2004, p. 101.

differences between them and the Greek horoscopes. The Seleucid horoscope relies entirely on the location of the planets in the zodiacal signs and interestingly enough, omen texts, whereas the Greek horoscope, dated to A.D. 46,<sup>66</sup> while definitely relying on the planets, also includes the signs located at the four cardines, in particular, the *horoscopos*. In addition, the Greek horoscope makes use of the Terms, a section of the signs which belong to a certain planet, giving the planet located in its own Term more power than it might otherwise have. Even with all these differences, the two horoscopes shown in the table below demonstrate significant commonalities, showing a developing branch of knowledge.<sup>67</sup>

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<sup>66</sup>Neugebauer and van Hoesen (ed. and trans.). *GH*, p. 21.

<sup>67</sup>Jones and Steele. 2011, para. 47-54.

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| <p>MLC 2190</p> <p>Year 77 (of the Seleucid Era, month) Siman, (from?) the 4<sup>th</sup> (day until? some? time?) in the last part of the night (of?) the 5<sup>th</sup> (day), Aristokrates was born.</p> <p>That day: Moon in Leo. Sun in 12;30° in Gemini.</p> <p>The moon set its face from the middle toward the top;<br/>(the relevant omen reads:) “If, from the middle toward the top, it (i.e., the moon) sets its face,<br/>(there will ensue destruction.” Jupiter . . . . . in 18°</p> <p>The place of Jupiter (means): (His life? will be) regular, well; he will become rich, he will grow old,<br/>(his days will be numerous (literally, long). Venus in 4° Taurus.</p> <p>The place of Venus (means): Wherever he may go, it will be favorable (for him); he will have sons and daughters. Mercury in Gemini,<br/>with the sun. The place of Mercury (means): The brave one<br/>will be first in rank,<br/>he will be more important than his brothers, . . . . .</p> <p>Saturn: 6° Cancer. Mars: 24° Cancer . . . . .</p> <p>The 22d and 23<sup>rd</sup> of each month . . . . .</p> <p>(Trans. Sachs. 1952, pp. 60-61.)</p> | <p>P. Oxy. 307</p> <p>We find the sun, the ruler of the world, in Capricorn 11 ½ degrees, terms of Jupiter. The moon, mother of all, we find in Aries 11 degrees, terms of Venus.</p> <p>Phainon, the (star) of Saturn, in Sagittarius 30 degrees approximately, terms of Mars. Phaethon, the (star) of Jupiter, in Cancer, 19 degrees, in retrogradation, terms of Saturn. Pyroeis, the (star) of Mars, in Aquarius, 14 ½ degrees, terms of Jupiter, in the house of the same. Phosphoros, the (star) of Venus, in Capricorn, 19 degrees. terms of Venus. Stil(bon)</p> <p>Stilbon, the (star) of Mercury, in Sagittarius 30 degrees, terms of Mars. The Horoscopus in Virgo, Midheaven in Gemini, setting (point) in Pisces, Lower Midheaven in Sagittarius.</p> <p>(Trans. Neugebauer and van Hoesen. 1959, p. 20.)</p> |
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New developments in Babylonian astrology have recently demonstrated even more common elements. In the past, the Terms were considered to be an element of astrology originating within the Greco-Roman tradition, but the discovery of two Babylonian tablets containing a system of Terms contradicts that idea.<sup>68</sup> Alexander Jones and John Steele’s discovery adds the system of Terms to the list of Babylonian contributions to Greco-Roman astrology. Based on the presence

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<sup>68</sup>Jones and Steele. 2011.

of zodiacal signs and the combination of old form and cursive writing, Jones and Steele assign a tentative date for the tablets of the fifth or fourth century B.C.<sup>69</sup> but a later date is possible. The variants found in the tablets do not correspond with any surviving sources either in the Greco-Roman world or in Egypt and their use within Babylonian astrology is not clear, but, although no surviving Babylonian protohoroscopes contain any references to the Terms, it is clear that the Terms were an element of Babylonian astrology. It should be noted that Pingree disagreed with the use of *horoscope* to describe these Babylonian texts because the term refers to the use of the ascendant or *horoscopos*, a piece of information *not* recorded in the Babylonian texts. In *From Astral Omens to Astrology*, he prefers the term “proto-horoscopes.”<sup>70</sup> Whether or not these texts qualify as horoscopes, however, they have much in common with the later Greek texts, not least of which because they are predictions made for an individual rather than a nation.

## 1.6 Astronomical and Cosmological Foundations of Greek Astrology

In examining the foundation of Greek astrology, it is important to note the development found within Greek scholarship itself. Much of astrology depends on philosophical and cosmological concepts which arose at least by the fourth century B.C. and possibly earlier. The sphericity of the earth and the planets, as well as the sphericity of the cosmos as a whole and the system of nested concentric spheres surrounding and rotating about a spherical earth all became part of the cosmological underpinnings of the practice of astrology.<sup>71</sup> Such ideas were commonly

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<sup>69</sup>Jones and Steele. 2011, para. 1.

<sup>70</sup>Pingree. 1997, p. 22.

<sup>71</sup>Although spherical astronomy was an important assumption in Greek thought, this is not a requirement for practicing any sort of astral divination or astrology. Neugebauer rightly points out that, while the Babylonian scholars appear to have assumed some sort of sphericity, it is not clear that they extended this to actual speculation on the size and shape of the universe. See *HAMA*, vol. 2, pp.575-577. More recently, Wayne Horowitz, in *Mesopotamian Cosmic Geography*, shows that the general shape of the heavens was circular, like flat rather than domed

accepted by most serious scholars by the time of Aristotle and his description of the cosmos as given in *Metaphysics* Λ and *On the Heavens* are general accounts, based on the work of Eudoxus who was, according to Dicks, “the first Greek astronomer of whom we have definite evidence that he worked with and fully understood the concept of the celestial sphere.”<sup>72</sup> This conception of the universe was not a foregone conclusion by any means. The ancient Egyptians depicted the world as being bowl-shaped with the goddess Nut stretched from horizon to horizon, while the Babylonians appear, as mentioned above not to have a specific conception of the universe at all (at least from surviving sources). Various pre-Socratic philosophers made a number of hypotheses about the shape of the cosmos from flat to shapes such as cylinders.

However, the geocentric theory of the universe became the generally-accepted conception. It appears to have originated with the Pythagorean school in the fifth century, although this is not known with certainty because of the scarcity of primary texts from the pre-Socratics.<sup>73</sup> The earliest author describing the geocentric theory in any detail is Aristotle himself. In *On the Heavens* II.11, after presenting the logical notion that the stars do not move and are therefore spherical, he adds another support to his theory by relating them to the moon:

Again, what holds of one holds of all, and the evidence of our eyes shows us that the moon is spherical. For how else should the moon as it waxes and wanes show for the most part a crescent-shaped or gibbous figure, and only at one moment a half-moon? And astronomical arguments give further confirmation; for no other hypothesis accounts for the crescent shape of the sun's eclipses. One, then, of the heavenly bodies being spherical, clearly the rest will be spherical also.<sup>74</sup>

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with the path of Enlil being a “curved band that encircles the earth’s surface.” See pp. 264-265, in particular.

<sup>72</sup>Dicks. 1970, p. 153.

<sup>73</sup>For a brief discussion of the origins of a spherical Earth, see Evans. 1998, p. 47 and Dicks. 1970, pp. 63-91.

<sup>74</sup>Aristotle/Stocks (trans.). *On the Heavens* II.11.

In the following sections (12-14), he discusses the position, size and shape of the Earth, placing it firmly in the center and taking the shape of a sphere (proved again by observations of the moon). In *Metaphysics* Λ.8 (1073b-1074a), the types of motions of the heavenly bodies are examined. It is here that Aristotle references Eudoxus, along with Callippus, regarding the movements of the planets, all of which are carried around the earth on rotating planetary spheres. This would, to varying degrees of mathematical interpretation, become the standard view of the structure of the universe.

Writing in the first century B.C., Geminus maintains the same stance, attributing to the Pythagoreans the common idea that “the movements of the Sun, Moon, and the five wandering stars are circular and uniform. For they did not accept, in things divine and eternal, such disorder as moving sometimes more quickly, sometimes more slowly, and sometimes standing still.”<sup>75</sup> He, in fact, calls it “the hypothesis that underlies the whole of astronomy.”<sup>76</sup> In the *Almagest* Ptolemy actually presents arguments illustrating that the heavens move as a sphere, that the Earth must be spherical, and that the Earth is in the center of the universe,<sup>77</sup> but according to Evans, by the second century, this was mainly pedagogical or a stylistic flourish, not an idea actually requiring detailed proof.<sup>78</sup> However, although Ptolemy’s introduction is giving basic information long accepted in Greek thought, he is also presenting important arguments supporting these assumptions rather than simply accepting them without thought.

## 1.7 Greek Divination

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<sup>75</sup>Geminus/Evans and Berggren (trans.). *Isagoge* I.19-20.

<sup>76</sup>Geminus/Evans and Berggren (trans.). *Isagoge* I.19.

<sup>77</sup>Ptolemy/Toomer (trans.). *Almagest* I.3-5.

<sup>78</sup>Evans. 1998, p. 48-49.

While the Greeks possessed a cosmological foundation lacking in Mesopotamian divination, like the Mesopotamians, the Greeks had a tradition of celestial divination which predates the rise of astrology. This took the form of a generally-unorganized reading of omens in celestial events (a practice which continued throughout Antiquity and into the Middle Ages) as well as the use of stellar risings and settings in weather prediction.

Possibly the most striking celestial events were solar, and to a lesser extent lunar, eclipses. The darkening of the sun, the reddening of the moon, both spoke to some ominous portent. There are stories about eclipses functioning as signs of bad things to come. Thucydides, in his account of the Peloponnesian War, mentions solar eclipses as one of the awful events which had been considered only tradition rather than fact but “suddenly ceased to be incredible.” Along with violent earthquakes, droughts, famines and the famous plague, Thucydides also mentions that “eclipses of the sun occurred with a frequency unrecorded in previous history.”<sup>79</sup> Thucydides specifically mentions the occurrence of solar eclipses at 2.28.1 and 4.52.1 and, beginning at 7.50.4, he discusses at greater length results of the famous lunar eclipse which frightened the Athenian army at Sicily. Plutarch, in his *De Fac. in Orb. Lun.*, makes reference to a recent solar eclipse during which the stars could be seen at noonday and compares the scientific explanations they discuss in the text to the reactions of earlier poets such as Pindar and Homer who “during eclipses bewail ‘the brightest star bereft’ and ‘at midday falling’ and say that the beam of the sun ‘<is sped> the path of shade’; and to the crown all he will cite Homer, who says ‘the faces of men are covered with night and gloom’...”<sup>80</sup> Pliny the Elder lauds the scholars who

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<sup>79</sup>Thucydides/Smith (trans.). 1928. *The History of the Peloponnesian War* 1.23.3.

<sup>80</sup>Plutarch/Cherniss (trans.). *De Fac.* 931E-931F. Dicks questions that the references in the *Iliad* truly refer to a solar eclipse, preferring the idea of the dust of battle obscuring the sun, but it is clear here that Plutarch makes that assumption. See Dicks, pp. 223-224.

dismissed the idea of eclipses as omens of doom and references the apocryphal story of Thales predicting a solar eclipse and, in doing so, “released the miserable mind of man from fear, mortality dreading as it did in eclipses of the stars crimes or death of some sort... or in the dying of the moon inferring that she was poisoned and consequently coming to her aid with a noisy clattering of cymbals...”<sup>81</sup> This superstitious fear, he says, is what led to the defeat of Nicias in his invasion of Sicily. In his life of Nicias, Plutarch describes the belief in lunar omens that prevented Nicias from making strategic moves which might have saved the Athenian armies. It is interesting to note that Plutarch makes a clear differentiation between the lunar eclipse which frightened Nicias and the new moon phase which “was already understood, even by the common folk.” The problem lay in not understanding how “being at the full, she [the moon] should on a sudden lose her light and emit all sorts of colors, this was no easy thing to comprehend. Men thought it uncanny, –a sign sent from God in advance of divers great calamities.”<sup>82</sup>

In addition to omens signaling future danger, there existed another tradition, mostly based on the need for weather prediction in a society based in agriculture and sea trade, and can be seen at least as early as the eighth century text by Hesiod entitled *The Works and Days*, a text in which Hesiod is apparently giving advice to his brother, Perses, on the best times of the year to engage in certain activities. The power of the predictions lies in a correlation between the patterns in the sky and the weather at certain times of the year. For example, the time for harvesting grapes is when “Sirius and Orion reach the midpoint in the sky, and the rosy-figured Dawn can see Arcturus rising high.”<sup>83</sup> In contrast, “at such time as the Pleiades are hurtling in flight toward the

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<sup>81</sup>Pliny/Rackham (trans.). *Natural History* II.53.

<sup>82</sup>Plutarch/Perrin (trans.). *Nicias* XXIII.2.

<sup>83</sup>Hesiod/Schlegel and Weinfield (trans.). *Works and Days*, Lines 609-611.



misty sea, before Orion in his might” one should avoid engaging in any sea voyages.<sup>84</sup>

In conjunction with the agricultural application of prediction, the field of medicine also used stars in their practice. In the fourth century Hippocratic text *Airs, Waters, Places*, there are references to the use of stars to aid in diagnosis of and in anticipating disease. “For knowing the changes of the seasons, the *risings and settings of the stars*, with the circumstances of each of these phenomena, he will know beforehand the nature of the year that is coming.”<sup>85</sup> In fact, the author of *Airs, Waters, Places* attributes a large role to astronomy, stating that

If it be thought that all this belongs to meteorology, he will find out, on second thoughts, that the contribution of astronomy to medicine is not a very small one but a very great one indeed. For with the seasons men’s diseases, like their digestive organs, suffer change.<sup>86</sup>

The stars could indicate what diseases would arise and how long they would last. For instance, by watching the stars, specifically Sirius and Arcturus, in conjunction with the sun and the winds which arose at different times of the year, a physician could predict whether fevers would be severe or slight, how much of disease would afflict the eyes and the lungs, etc.<sup>87</sup> Much like for Hesiod in reference to agriculture and navigation, Hippocrates advocated knowing the movements of the stars as part of the practice of medicine.

The following are the four most violent changes and the most dangerous: —both solstices, especially the summer solstice, both the equinoxes, so reckoned, especially the autumnal. One must also guard against the risings of the stars, especially of the Dog Star, then of Arcturus, and also of the setting of the Pleiades. For it is especially at these times that diseases come to a crisis.<sup>88</sup>

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<sup>84</sup>Hesiod/Schlegel and Weinfield (trans.). *Works and Days*, Lines 618-630.

<sup>85</sup>Hippocrates/Jones (trans.). *Airs, Waters, Places*, II.14-17.

<sup>86</sup>Hippocrates/Jones (trans.). *Airs, Waters, Places*, II.21-26. Note that meteorology includes astronomy here.

<sup>87</sup>Hippocrates/Jones (trans.). *Airs, Waters, Places*, X.

<sup>88</sup>Hippocrates/Jones (trans.). *Airs, Waters, Places*, XI.7-15.

Such usage of the heavens to tell what is coming on the earth demonstrates the presence of the idea of the stars having an impact on the lives of individuals. In general, the Hippocratic corpus indicates correlation not causation, nor is there any concern with the motions of stars and planets beyond the rising of a star at a certain time of the year, much as Hesiod did a few centuries earlier; however, these early instances of stellar influence show that the idea of the stars being able to have an impact on the terrestrial sphere was already present within Greek thought.

In addition to the general traditions shown by Hesiod and the Hippocratic corpus, the *parapegmata* (sg. *parapegma*), a sort of ancient almanac, or as Lehoux defines it, “any instrument that tracked cyclical phenomena by the use of a movable peg or pegs,”<sup>89</sup> used the stars to predict what the weather would be like on specific days of the year. A number of literary *parapegmata* survive from antiquity which essentially list the stars or constellations and what weather may be associated with them, according to ancient authorities which may have been a way of lending credence to the predictions. Lehoux notes that the use of stellar prediction in weather was a common practice in much of the ancient world outside Greece and Mesopotamia, including Egypt.<sup>90</sup> The *parapegmata* were formalized versions of the astrometeorology found in earlier texts such as those of Hesiod mentioned above but with more reliance upon textual claims than on actual observations. In the literary *parapegmata*, at least, it is previous authorities who carry weight, rather than the observations themselves. Ptolemy says, in the introduction to his *Phaseis*, that he will be laying out the computations “only for the more noteworthy bright fixed stars, along with the weather changes which have been observed *by our predecessors* at the phases.”<sup>91</sup>

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<sup>89</sup>Lehoux. 2007. *Astronomy, Weather, and Calendars in the Ancient World*, p. 12.

<sup>90</sup>Lehoux. 2007. *Astronomy, Weather and Calendars*, pp. 8-11.

<sup>91</sup>Ptolemy/Jones (trans.). *Phaseis*.

Lehoux argues that, while there is *some* indication of an observational tradition, the claim that the parapegmata are observational in nature is not completely valid.<sup>92</sup> What we see in these texts, however, is a continuation of the astrometeorological tradition beginning at least with Hesiod. One can predict the weather based on stellar risings and settings. In the Miletus parapegma, an inscriptional parapegma, a sample of the surviving portion reads “...] the south wind blows according to Eudoxus [and the Eg]yptians; and according to the Indian Cal[aneus,] Scorpio sets with thunder and wind.”<sup>93</sup> Within the text of the Geminus parapegma, a text appended to the end of the *Isagoge*,<sup>94</sup> as with the later *Phaseis*, appeals to ancient authority, along with descriptions of stellar risings and settings, are what guides the meteorological prediction. For example, when the sun is traversing the sign of Cancer, on the twenty-seventh day, “According to Euctemon Sirius rises. According to Eudoxus Sirius rises in the morning, and for the next fifty-five days the Etesian winds blow. The first five (days, the winds) are called the *Prodromoi*. According to Callippus Cancer <finishes> rising, windy.”<sup>95</sup> In both cases the text shows the awareness of a correlation between the setting of the Pleiades and inclement stormy weather or the rising of a star in the tail of Leo and the rising of Capella (depending on location) with various winds and possible rain and thunder. It is not necessary that the stars actually cause the phenomena. In fact, Geminus devotes a chapter of his *Isagoge* (XVII) to denying that the stars could possibly be

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<sup>92</sup>Lehoux. 2004, p. 236.

<sup>93</sup>Miletus II, Inv. No. 456 D. Trans. Lehoux. 2007, p. 225.

<sup>94</sup>The authorship of the parapegma is still in dispute although it is attached to all the extant manuscripts of the *Isagoge*. For a discussion of the Geminus parapegma, along with references to the debate of its authorship, see Evans and Berggren (2006), Appendix 2, pp. 275-289. Evans and Berggren do not take a position themselves, preferring to leave the matter undecided in light of a lack of evidence, but they do present a brief summary of both sides.

<sup>95</sup>Geminus/Lehoux (trans.). *Parapegma*, p. 233.

responsible for the weather on earth, although he does not discount that the stars could function as *signs* of what type of weather could be expected. The fact that he feels the need to criticize the possibility of the stars causing the weather on the earth denotes the presence of a prevailing belief to that effect. The stars did not necessarily cause the weather patterns, but they could be used to get an idea of what the weather would be like at that time.<sup>96</sup>

Even so, the recognition that the celestial realm influenced the terrestrial world was not dependent on the tenets of astrology. The passage of the sun through the sky obviously affected the changing seasons. Although the mechanism was unknown, the moon and the tides were clearly linked in some way. In addition, both Hesiod and the author of the Hippocratic text appear to have subscribed to some form of genuine celestial influence in their writings. For Hesiod, Sirius, as the brightest star in the heavens, also had an effect on the earth: “When Sirius the dog star dries the head up and the knee, and skin is parched beneath the burning sun, then let there be some shade beneath a rock and wine from Biblos...”<sup>97</sup> In this instance, while it is possible that it might be a figurative description, Hesiod seems to be ascribing an ability to affect the terrestrial sphere to a star, not the sun and moon. As was mentioned, the Hippocratic corpus contains references to the effects of the heavens on the earth. By the time of Geminus, it is clear that there is an entrenched belief that the stars can affect the terrestrial sphere. It is a beginning to a sort of stellar influence in the Greek-speaking world and another forerunner to the later development of astrology in the Hellenistic era. The more obvious phenomena, such as the sun and moon, lent themselves to positions of import in defenses of the validity of astrology because,

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<sup>96</sup>Note also that the *paraepgmata* and other elements of astrometeorology only make use of the stars, not the planets which are so prominent in horoscopic astrology.

<sup>97</sup>Hesiod/Schlegel and Weinfield (trans.). *Works and Days*, Lines 587-589.

if the sun and moon are able to affect the seasons and the oceans, why can they not affect those living on the earth?

### 1.8 The Rise of Greco-Roman Astrology

In terms of survival and overall influence on later works, the *Tetrabiblos* of Ptolemy is one of the most prominent astrological texts coming out of the Greco-Roman world. However, its date of composition in A.D. mid-second century bypasses at least 200 years of development and probably more. The oldest surviving horoscope has been dated to 72 B.C., although Neugebauer and van Hoesen dated the casting to ten years later.<sup>98</sup> Based on surviving sources, Pingree places the date of the “invention” of astrology, specifically genethliacal astrology, in the second century B.C. This date is late enough to allow for the entrenchment of the Aristotelian universe as well as the increasing mathematical ability to calculate the positions of the planets and document their motions and early enough to account for the varieties of practices found in the extant texts. Within this astrology are the elements which rely on both Greek and Mesopotamian antecedents: the geocentric theory of the universe as well as the Hellenistic order of the rotating spheres and the Mesopotamian concepts of benefic and malefic planets as well as the signs of the zodiac and the triplicities.<sup>99</sup>

References to astrology are found in Cicero’s *De divinatione* and *De fato* from the first century B.C. and although Cicero’s knowledge of the science is slight, the work does show a practice of some sort. In his condemnation of astrology, Cicero sets up Panaetius (third century

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<sup>98</sup>Pingree. 1997, p. 26. He refers to *GH* pp. 76-78 for the discussion about the mentioned horoscope.

<sup>99</sup>Pingree. 1997, pp. 26-29. See also Rochberg-Halton (1988) and (1984), specifically pp. 120-122. The triplicities are four groups of three zodiacal signs each associated with one of the four elements in Greek astrology, although Geminus associates them with the cardines.

B.C.) as the only Stoic to reject the idea of forecasting the future via astrology. However, his understanding of astrology appears lacking whether by design or by simple ignorance of an uncommon practice. He spends very little time on astrology as a form of divination, mentioning it only once in Book I as a form of divination common among the Assyrians and Egyptians because of the “vast plains inhabited by them” and “the open and unobstructed view of the heavens presented to them on every side”<sup>100</sup> and again in Book II in the form of a diatribe which runs from II.87-99. The rest of the work is given to other types of divination or as an analysis of their underlying philosophy. In the surviving fragments of *De fato*, the mention of astrology is even more brief. Cicero uses the example: “If anyone has been born with the Dogstar rising, that man will not die at sea,”<sup>101</sup> but the example is used to discredit Chrysippus and his views on fate. For Cicero, although astrology appears not to have been a prominent part of divination, it was practiced in his time. Also from the first century B.C.,<sup>102</sup> Geminus’ *Isagoge* contains references to the Chaldeans<sup>103</sup> and to some common astrological tenets. In laying out the zodiacal signs in Book II, Geminus mentions what effect certain relations between them have on nativities, e.g. opposition (II.5), trine (II.8-13) and quartile (II.18-26). These references, though brief, demonstrate the existence of some form of astrology in this time period.

In terms of texts specifically devoted to astrology, we must turn to the first century A.D. with the works of Manilius and Dorotheus of Sidon.<sup>104</sup> As was common for astrological texts,

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<sup>100</sup>Cicero/Falconer (trans.). *De div.* I.2.

<sup>101</sup>Cicero/Sharples (trans.). *De fat.* VI.12.

<sup>102</sup>Following Jones. 1999.

<sup>103</sup>E.g. see I.9, II.5

<sup>104</sup>This text survives only in fragments and in an Arabic translation. See Pingree. 1978, pp. 426-427 and (1976) *Dorothei Sidonii: Carmen Astrologicum*.

both men attributed their art to those wiser than they. For Manilius, astrology is “munere caelestum,” a gift from the gods first practiced by Mercury.<sup>105</sup> In a more earthly attribution, Dorotheus claimed to have gleaned his knowledge from his travels in Egypt and Babylon when he “collected the best of their sayings from the first [authorities] who were before me like the bees which gather [honey] from the trees and all kinds of plants.”<sup>106</sup> In spite of this commonality, the two treatises reveal a practice still in flux with methodical and even philosophical differences. There are, of course, similarities in the texts, but each author has individual procedures which he follows. For example, Manilius, beginning at III.510, discusses the periods of life by means of the “chronocrators,” a common idea wherein various celestial motions affect the divisions of the life of a native, but his method is distinct in that he uses the signs of the zodiac to denote the divisions, giving two variations on his idea. The simpler variation relies on the ruler of the first year of life being whatever sign is the horoscopos of the native. The second year is the second sign and so on until the cycle starts over again. The lords of the months, days and hours are assigned in a similar fashion. Dorotheus, in Book III, discusses the times of life but uses the planets as indicators, not the signs, depending on the positions of the various planets within the zodiac to indicate what fortunes will befall the native during each period.

One aspect of defenses of astrology (as well as attacks) involved a definite shift from the Babylonian omen texts, from Greek omens and medical texts, and even from the earliest Babylonian horoscopes. As has been mentioned above, the earlier omen texts demonstrate a practice that is much more akin to religious worship than to a science, in that the omens were given by the gods and put in the stars for mankind to read. The shift that we see in the Greco-

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<sup>105</sup>Manilius/Goold (trans.). *Astronomica* I.25-31.

<sup>106</sup>Dorotheus of Sidon/Pingree (trans.). *Carmen Astrologicum*, I.4-5.

Roman texts begins a process of removing the gods as the source of the signs found in the stars. The works of Manilius and Dorotheus, even the attack by Cicero and the brief mention by Geminus, all show a practice in which there is some assumption of celestial influence on the earth, rather than a sign in heaven from the gods or a mere correlation between the celestial and terrestrial realms. This assumption of the philosophical concept of determinism became an important part of defending astrology. Astrologers and sympathetic scholars had to either explain how determinism functioned within astrology or else explain how it was not really a part of astrology. Often, although not specifically mentioned, the need to address this point arose quite often. In order to understand the importance of determinism within the practice of astrology, it is worth making a digression into its origins and principles.

## 1.9 Determinism

In the absence of gods putting the signs in the heavens for mankind to read, there is a need for a replacement explanation, an answer to the question of why reading the movements of the stars and planets leads to a prediction of future events in the terrestrial sphere. This need was filled by ascribing some sort of astral influence on the earth by the heavenly spheres. Even at the time of Hesiod, there were indications of a belief in astral influence. The rising of Sirius corresponded with an increase in temperature. Although this is not much different from the effect of the sun on the earth, it is significant in that it created a possibility of celestial objects other than the two luminaries affecting the sublunar realm. Although the events described in the Hippocratic corpus and the *paraepgmata* do not depend on stellar influence as such, it is a fairly simple step to move from a certain star in the sky corresponding to an increase in fevers or other illness to that certain star *causing* the increase. Another stage of this theory of change in the sublunar realm is found in Aristotle's *On Generation and Corruption*. In Book II, he describes



the importance of the duality of movements of the sun in creating change on the earth. “For if coming-to-be and passing-away are always to be continuous, there must be some body always being moved (in order that these changes may not fail) and moved with a duality of movements (in order that both changes, not one only, may result).”<sup>107</sup> This body is the sun. The influence of the sun on the earth is accomplished through its motion, both its risings and settings and its shift from north to south in the sky.

Related to this principle of celestial influence on the terrestrial realm is the philosophical principle of determinism, or the idea that all events have a necessary cause which determines their occurrence. This general principle was then extended to human lives. Determinism on its own was a subject of some controversy in ancient philosophy. The idea that human beings have no control over their own lives could and did cause a measure of debate among the various philosophical schools.<sup>108</sup> The most well-known advocates of determinism and fate were the Stoics. Stoicism began with the teachings of Zeno of Citium in the third century B.C. and was based on the idea that the cosmos is a single unified entity and that everything within it is inextricably connected.<sup>109</sup> There is nothing outside the cosmos and thus there is nothing external which can affect it. Within the cosmos every individual part, from the stars to plants to people, is connected through a network of causes which affects *every* aspect of the cosmos. They cannot be avoided because there is no way of removing oneself from the network of causes. That would require removing oneself from the universe. In his *Moralia*, Plutarch quotes Chrysippus, one of the early leaders of the Stoic school, as saying that

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<sup>107</sup>Aristotle/Joachim (trans.). 1922. *Generatione et Corruptione* II.10.

<sup>108</sup>See, for example, Cicero’s *De fato*, Boethius’ *De consolatione philosophiae*, Proclus’ *De providentia*, and Alexander of Aphrodisias’ *De fato*.

<sup>109</sup>Bobzien. 2005, p. 490.

For since the common nature stretches into all things, it must be the case that everything that happens in any way whatsoever in the universe and in any of its parts will have happened in accordance with that nature and its reason in unimpeded sequence; for neither is there anything to obstruct the organization from the outside nor can any of its parts change or be in any qualitative state except in accordance with the common nature.<sup>110</sup>

Such a stance indicates that there is only one way for things to turn out, i.e. all events are fated to occur in a specific, organized fashion, not randomly. Interestingly, this includes both good and evil doings. Manilius, good Stoic that he was, subscribed to this idea saying,

Let man's merits, therefore, possess glory all the greater, seeing that they owe their excellence to heaven; and, again, let us hate the wicked all the more, because they were born for guilt and punishment. Crime whencesoever sprung, must still be reckoned crime. This, too, is sanctioned by fate, that I should thus expound the rule of fate.<sup>111</sup>

However, this does not automatically give rise to an ability to predict the courses of events.

Although there is a cause for every event, these causes are not strictly linear; rather, "there is an eternal causal nexus, where cause gives rise to cause,"<sup>112</sup> meaning that we may not be able to see what has caused every event to take place. Even so, according to Plutarch, Chrysippus claimed that there was nothing which was not caused. Even occurrences which seemed spontaneous were simply when "concealed causes sneak in and, without our noticing it, they lead the impulse to one of the two alternatives."<sup>113</sup> Thus, there is no event, no moment, no object within the cosmos which is not determined. Man cannot always see what determines his actions, but it does exist and nothing can be done to thwart it because even the attempt to do so was determined.

This determinism is the tenet which differentiated astrology from its Mesopotamian and

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<sup>110</sup>Plutarch. *Stoic. rep.* 1050c, as quoted in Bobzien (2005).

<sup>111</sup>Manilius/Goold (trans.). *Astronomica*, IV.114-118.

<sup>112</sup>Frede. 2003, p. 189.

<sup>113</sup>Bobzien. 2005, p. 502. Plutarch. *Stoic. rep.* 1045c. See Cicero, *De div.* II.15 for an example of one argument against the elimination of chance.

Greek predecessors. Applying determinism to the movements of the heavens, i.e. that the stars are not merely signs but causes which dictate the course of events, shifts the practice away from future events being shown in the heavens by the will of the gods to the influence of the stars. Interestingly, astrology was not a major aspect of Stoic thought despite the link of determinism.<sup>114</sup> Astrology's philosophical foundation lay on the concepts of determinism and causation, but as a point of argument within philosophy, it has only rare mentions in the early stages of the evolution of determinism. The reverse, however, is not the case.

The defenses of and attacks on astrology in Antiquity revolve around the validity of determinism and prediction. However, these arguments, although relying on the same basic pieces, often took different tacks in justifying the practice. In looking at two early examples, Manilius and Cicero, there is a commonality in their arguments: Both assume an absolute, all-or-nothing determinism. As Manilius wrote, *fata regunt orbem* or "Fate rules the world."<sup>115</sup> His point of view on astrology is that everything is fated to happen, including the "will to learn fate's laws"<sup>116</sup> and that there is no altering that fate. Nothing can change what will come. He goes on in Book IV to elaborate on his claim, giving examples of the power of Fate ranging from the founding of Rome to the events of the Punic Wars to the vagaries of death,<sup>117</sup> concluding that "clearly, there is another and greater power to constrain and rule us, and to subject mortal affairs to laws of its own: it gives birth to men and at their birth determines the number of their years

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<sup>114</sup>Long. 1982, p. 191.

<sup>115</sup>Manilius. *Astronomica* IV.14.

<sup>116</sup>Manilius. *Astronomica* II.149.

<sup>117</sup>Manilius. *Astronomica* IV.26-93.

and the changes of their fortunes.”<sup>118</sup> The assumption is that Fate willed these things to happen, that the stars, although far away, “give to the peoples of the world their lives and destinies and to each man his character.”<sup>119</sup> Although man cannot change his fate, there is value in understanding and discovering one’s fate. Man is good or bad by the whims of fate, but if one seeks to know his fate, he will come to understand the universe, or in Manilius’ words: *mens humana potest propria discedere sede/ inque ipsos penitus mundi discender census*.<sup>120</sup> For the Stoic, the ultimate achievement is to become wise, to bring one’s mind into alignment with the universe. It does not change one’s fate but brings one closer to the divine and “reason is what triumphs over all.”<sup>121</sup>

Cicero, in contrast, while subscribing to the idea that there are only two options, all things operating by fate or fate having no power over the world,<sup>122</sup> uses that as a mark *against* the possibility of fate in general and astrology specifically. Manilius, possibly with an attack like Cicero’s in mind, claimed that the act of knowing led to wisdom which validated learning what the stars had in mind. Cicero claimed that no good can arise from knowing one’s future. “For if all things happen by Fate, it does us no good to be warned to be on our guard, since that which is to happen, will happen regardless of what we do.”<sup>123</sup> Cicero’s description of astrology as “Chaldaeorum monstra” at *De div.* II.87 leaves little doubt as to his opinions on astrology itself. His attack both in *De divinatione* and in *De fato* contains no recognition of anything but absolute

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<sup>118</sup>Manilius. *Astronomica* IV.98-101.

<sup>119</sup>Manilius. *Astronomica* II.82-86.

<sup>120</sup>Manilius. *Astronomica* IV.877-878.

<sup>121</sup>Manilius/Goold (trans.). *Astronomica* IV.932.

<sup>122</sup>Cicero/Sharples (trans.). *De fat.* XVII.39, p. 85.

<sup>123</sup>Cicero/Falconer (trans.). *De div.* II.21.

determinism. He describes the practice in this way:

Now since, through the procession and retrogression of the stars, 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 probably, but certain that just as the temperature of the air is regulated by this celestial force, so also children at their birth are influenced in soul and body and by this force their minds, manners, disposition, physical condition, career in life and destinies are determined.<sup>124</sup>

In the following sentence, he calls this *deliriationem incredibilem* and dismisses the possibility of that influence based on the distance of the planets from the earth.<sup>125</sup> Even if he grants the possibility, there is the problem of how the stars can look different at different places on the earth and still create the same effects on people in various locations.<sup>126</sup> Then, Cicero complains about the fact that the Chaldeans take no thought as to other possible influences on the birth of a child from weather to the obvious effects of the parents on the child, i.e. that the “carriage and gestures of children are derived from their parents.”<sup>127</sup> As Manilius would later do to prove astrology, Cicero uses historical examples to *disprove* it. He concludes by saying that “it would seem very strange to me should anyone, especially at this time, believe in men whose predictions he sees disproved every day by actual results.”<sup>128</sup>

Both Manilius and Cicero, writing perhaps fifty years apart, describe an astrology which is strictly deterministic, true or false. This astrology is generally horoscopic although they make no explicit differentiation among the various types. There was no middle of the road in which their astrology could be practiced using a limited determinism. Rather, it is one in which man’s

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<sup>124</sup>Cicero/Falconer (trans.). *De div.* II.89.

<sup>125</sup>Cicero. *De div.* II.91.

<sup>126</sup>Cicero. *De div.* II.92-93.

<sup>127</sup>Cicero. *De div.* II.94.

<sup>128</sup>Cicero. *De div.* II.99.

fate is determined and unchangeable no matter what man may do to try and stop it. This strict determinism is one which eliminates man's free will. Limited determinism preserves human free will while still acknowledging the stars as causes, even as primary causes in the sublunar realm.

### 1.10 Defending the Sciences

Before looking at attacks on and defenses of astrology, it is important to examine the general tradition which existed in the Greco-Roman world of defending the sciences, a tradition dating back at least to the fifth and fourth centuries B.C., particularly in the medical literature. As can be seen in works from the Hippocratic corpus, there was a need for “defining medicine and setting down its methods” as well as for distinguishing doctors from laymen and real doctors from frauds.<sup>129</sup> In *On the Art*, the author has undertaken the defense of medicine in the face of apparent criticism. The author never identifies his attackers, but Lloyd feels that there is a genuine opponent being targeted in the text.<sup>130</sup> The beginning of the defense is a definition of the medical arts. This definition contains two parts: the removal of suffering and the alleviation of disease, as well as *not* treating a disease that has no hope of a cure.<sup>131</sup> The other part of his defense of medicine involves eliminating things that happen spontaneously. It is possible for chance to come into play, but any healing which occurs happens because of something that was done, be it by the patient alone or by the doctor. The author claims that “medicine is real not just because it acts *διὰ τι* but also because its results can be foretold.”<sup>132</sup> In another text from the Hippocratic corpus, *On Regimen in Acute Diseases*, the author compares medicine to the practice

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<sup>129</sup>Lloyd. 1991, p. 249.

<sup>130</sup>Lloyd. 1991, p. 253.

<sup>131</sup>Lloyd. 1991, p. 253.

<sup>132</sup>Lloyd. 1991, p. 254.

of divination, claiming that doctors need to be able to make prognoses. Because this is a form of prediction, Lloyd gives examples of other texts such as *Prognostics* and *Epidemics* which make a comparison between the art of medicine and that of prophecy.<sup>133</sup> A quick glance at the beginning of *Prognostics* shows a similar effort both to defend the practice of medicine and to compare it to the act of prophecy. The author defends the doctor's art by stating that not every patient can be cured and that there is great value in knowing the progression of a disease, even if that progression leads to death.<sup>134</sup> This trend of comparing, as well as linking divination and medicine continues as we shall see below. Another important part of the early defenses of medicine can be seen in *On Ancient Medicine*. This text also takes time to defend medicine, but in a different manner from *On the Art*, in that the author chooses to elucidate just how exact one can expect medicine to be. Rather than claim a degree of perfection which could easily be dismissed, there is an explicit statement that medicine is not an exact art. This does not mean that it is not worth studying, nor that it will always be wrong.

For one must aim at a measure; but will find no measure—nor number nor weight besides—by referring to which you will know with precision, except the feeling of the body. Hence it is difficult to acquire knowledge so precise that one errs only slightly in one direction or the other.<sup>135</sup>

While training can lead to some degree of expertise, “perfect exactness is unattainable.”<sup>136</sup> This emphasis on the value of medicine even with its inherent distance from total precision would find similar expressions in defenses of astrology as well.

Another purpose of these defenses can be ascribed to the fact that, in some cases, the

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<sup>133</sup>Lloyd. 1991, p. 255.

<sup>134</sup>Hippocrates/Kelly (trans.). *The Book of Prognostics*, p. 42.

<sup>135</sup>Hippocrates/Schiefky (trans.). *On Ancient Medicine*, 9.3.

<sup>136</sup>Lloyd. 1991, p. 257.

“investigators into nature laid claim to a new kind of wisdom,” one that rendered unnecessary previous beliefs in the power of the gods to cause disease.<sup>137</sup> This rationalizing of medicine would naturally cause some degree of disagreement due to the undermining of tradition, be it intentional or otherwise. Doctors could expect to be required to justify their diagnoses, their treatments and to navigate between innovation and tradition. The written word and the rise of literacy in Antiquity also led to the development of the process of justification. This need could be seen in medicine as well as in other areas of natural philosophy. This was because “the individual often thought of himself as participating in—and sometimes literally participated in—a debate in which the personal contribution of each participant was clearly marked as *his*.”<sup>138</sup> This debate, be it between practitioners of the same art or between opposing sides, was an illustration of the rivalry which existed among those who made claim to wisdom in Antiquity. Lloyd argues that this tension between innovation and tradition, along with the need to justify whatever process one used, continued at least until the sixth century A.D. when Christianity was made the official religion of the Roman Empire.<sup>139</sup>

Although medicine shows this tradition of defending one’s work (in some cases, even feeling the need to defend the designation of being a τέχνη), it is not an isolated case, and the tradition of laying out the reasons that a particular art or science was valid and was important enough to be practiced can be found in other areas as well. The general art of divination required a defense. Plutarch addressed the issue of divination in his “Life of Nicias” and in some of the essays found in his *Moralia*. Nicias was the general who led the Athenian army to its disastrous

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<sup>137</sup>Lloyd. 1987, p. 49.

<sup>138</sup>Lloyd. 1987, pp. 100-102.

<sup>139</sup>Lloyd. 1987, pp. 107-108.



attempt to conquer Sicily and also was a believer in divination and celestial omens. Plutarch's presentation of the life of Nicias shows a definite belief in the validity of divination. He states that, although there were priests who were opposed to the Sicilian expedition, Alcibiades manipulated public opinion by finding oracles that prophesied good things while suppressing any prophecy that would contradict his assumption of success.<sup>140</sup> Plutarch describes the real prophecies from the mutilation of the statues of Hermes and the oracle at Delphi "seemed to advise the city to remain at peace."<sup>141</sup> In addition, Meton took steps to get out of the expedition, although Plutarch states that it could have been due to the aforementioned signs or because he "had already convinced himself of its failure by his own calculations."<sup>142</sup> Plutarch's presentation, rather than being a wholesale defense of divination, demonstrates his awareness of astronomical phenomena. He describes Nicias' belief in the evil portent of the lunar eclipse as due to his lack of understanding and the fact that his soothsayer had recently died, not because there is no validity to divination. Nicias' superstitions had been calmed by his soothsayer in the past. If his advisor had lived, Plutarch implies that Nicias would not have been taken in by the lunar eclipse.<sup>143</sup> While not an explicit defense of divination, the life of Nicias can be seen as an extended warning against the rejection of omens. In spite of Nicias' superstition, the overall impression is that, when done right, divination leads to real knowledge.

In his *Moralia*, Plutarch again addresses the concept of divination and prophecy. In his dialogue on "Why the Oracles Cease to Give Answers," Plutarch engages in a lengthy discussion

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<sup>140</sup>Plutarch/Scott-Kilvert (trans.). "Nicias" 12-13.

<sup>141</sup>Plutarch/Scott-Kilvert (trans.). "Nicias" 13.

<sup>142</sup>Plutarch/Scott-Kilvert (trans.). "Nicias" 13.

<sup>143</sup>Plutarch/Scott-Kilvert (trans.). "Nicias" 23.

of what has happened to the oracles which, in the past, were of greater number and were also very reliable. Plutarch asks the reason for the decay of reliance on the oracles. One of the speakers in the essay, Demetrius, answers “You need not busy yourself in enquiries after the oracles in those parts, seeing we find the oracles in these parts to fail or (to speak better) to be totally silenced, except two or three; so that it would be more to the purpose to search into the cause of this silence.”<sup>144</sup> Throughout the essay, Plutarch defends divination in several ways, in an attempt to explain why, in his own time, the oracles were on the decline. In his defense of divination and prophecy, he gives many examples of prophecies that came to pass which were given by various oracles throughout Greece. In addition, he gives reasons for the silence of the oracles now in such a way that would preserve their validity. One reason he gives is the corruption of the world, stating that the gods do not wish to leave them in a place where they will be defiled through vulgar and base questions. He also presents the possibility of lower populations around the ancient oracles as a reason for their disappearance, claiming that the gods know that there is little need for an oracle in a place that has few inhabitants.<sup>145</sup> In the midst of his discussion of divination, Plutarch presents the problems of fate and also the role of the planets in divination. He disagreed strongly with Stoic philosophy and took many opportunities to deride its tenets. Leading up to his ideas about the role of the stars, he rejects what he describes as a Stoic doctrine which denies the plurality of worlds and would require multiple sets of gods to administer to other worlds and be the causes for all that happens in those worlds. As a comparison, he calls up an example of the stars. He says that the gods are “like Castor and Pollux, ready to succor such as are overtaken by bad weather at sea; for when they appear, the

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<sup>144</sup>Plutarch/Goodwin (trans.). “Why the Oracles Cease to Give Answers” para. 5.

<sup>145</sup>Plutarch/Goodwin (trans.). “Why the Oracles Cease to Give Answers” para. 7-8.

winds cease and the waves are calmed. Not that they navigate and are partakers of the same peril; but they only appear in the sky, and the danger is over.”<sup>146</sup> Here, he presents the stars Castor and Pollux as stars with the ability to influence the sublunar world. They are separate from the world but they can aid those living in it.

Returning to his arguments about divination, Plutarch undertakes to explain how and why divination can work and it is here that his similarities to the defenses of the sciences can be seen. According to Plutarch, the reason why divination can occur is because of the nature of the human spirit. It is the same as that of the daemons who, it is argued, are those who are responsible for prophecy in the first place. He compares divination to the act of remembering, calling it the “reverse of divination.” If a person can preserve events of the past in his mind, he can then touch the things which are in the future and can know what is coming.<sup>147</sup> This comparison of seeing the future with remembering the past is reminiscent of the use of analogies and comparisons found in defenses of the sciences and will be seen specifically in defenses of astrology. In another analogy, he compares the exhalations from the earth that can sometimes give the power of divination to searching for ore in mines. Eventually, the vein will run out. Similarly, the exhalations are not immortal but can also run out and lose their power, leading to a loss of prophetic power.<sup>148</sup> The reason for error in prophecy is due to the nature of divination. “Now the faculty of divining, like blank paper, is void of any reason or determination of itself, but is susceptible of fantasies and presentiments.”<sup>149</sup> Plutarch also uses Aristotelian properties to give a rational explanation for

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<sup>146</sup>Plutarch/Goodwin (trans.). “Why the Oracles Cease to Give Answers”, para. 30.

<sup>147</sup>Plutarch/Goodwin (trans.). “Why the Oracles Cease to Give Answers,” para. 39.

<sup>148</sup>Plutarch/Goodwin (trans.). “Why the Oracles Cease to Give Answers,” para. 43-44.

<sup>149</sup>Plutarch/Goodwin (trans.). “Why the Oracles Cease to Give Answers”, para. 40.

divination. He explains that the soul is hot and fiery and that when the body is changed to that state, divination can occur. It is dryness and heat together that makes it possible for “this part of the soul which does prognosticate may become more intense and get a perfect edge.”<sup>150</sup> His major defense of divination concludes with anecdotal proof of its efficacy. In a similar manner to the lists provided by Manilius and Cicero, Plutarch tells stories of how oracles have accurately given prophecy even in the face of doubts.<sup>151</sup> His defense of divination and the use of oracles is very similar to the defenses of medicine.

The tradition of defending one’s chosen science, while not only a direct response to attacks, is linked to the existence of polemics against it. When it comes to the practice of astrology, attacks *and* defenses follow this same tradition.

### **1.11 Polemics against Astrology**

While the defenders of astrology rarely cited specific attackers in their works, the polemical literature against astrology was vast. There are different degrees of criticism leveled at astrology in Antiquity. They range from the listing of arguments for and against as illustrated by Cicero to the Sophist Favorinus’ listing of errors and the absolute rejection by the Skeptic Sextus Empiricus in his *Against the Professors*, and to the more rounded critiques given by Plotinus in the *Enneads*. These four scholars are not the only critics of astrology in Antiquity, but from their works, it is possible to see the general trend of attacks on astrology.

The Academic scholars used similar arguments to reject astrology. Cicero, in the first century B.C., is attacking an astrology that is much less nuanced. His dismissal of divination, i.e. the process of predicting the future, as found in *De divinatione* and *De fato*, includes an attack on

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<sup>150</sup>Plutarch/Goodwin (trans.). “Why the Oracles Cease to Give Answers”, para. 41.

<sup>151</sup>Plutarch/Goodwin (trans.). “Why the Oracles Cease to Give Answers,” para. 45.

deterministic astrology. When asking if foreknowledge is even possible, he says,

For we do not apply the words ‘chance,’ ‘luck,’ ‘accident,’ or ‘casualty’ except to an event which has so occurred or happened that it either might not have occurred at all, or might have occurred in any other way. How, then, is it possible to foresee and to predict an event that happens at random, as the result of blind accident, or of unstable chance?<sup>152</sup>

If one, instead of accepting that events happen by chance, asserts that all things are predetermined, Cicero then questions the possibility of any good coming from knowing one’s fate.<sup>153</sup> If nothing can change the coming event, good or bad, then regardless of what was done or not done, the result is unchangeable. “Then what becomes of that vaunted divination of you Stoics? For if all things happen by Fate, it does us no good to be warned to be on our guard, since that which is to happen will happen regardless of what we do.”<sup>154</sup> Even those who tried to weave some defense into their assertions of the supremacy of fate could not succeed. Either fate controls everything or it controls nothing.

Cicero’s attack on astrology, although only a small section of the overall discussion of divination, contains the same disdain for determinism mingled with his rejection of divination by observation of the heavens. He describes the belief in astrological prediction as the idea that because the heavens obviously affect such things on earth as temperature, that “children at their birth are influenced in soul and body and by this force their minds, manners, disposition, physical condition, career in life and destinies are determined.”<sup>155</sup> Such a belief he calls “inconceivable madness” (*delirationem incredibilem*) because calling it “foolishness” (*stultitia*) is not a strong

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<sup>152</sup>Cicero/Falconer (trans.). *De div.* II.15.

<sup>153</sup>More than likely, it is this type of argument that Manilius and Vettius Valens had in mind when writing their respective defenses of astrology.

<sup>154</sup>Cicero/Falconer (trans.). *De div.* II.21.

<sup>155</sup>Cicero/Falconer (trans.). *De div.* II.89

enough epithet. The arguments used by Cicero to reject astrology are similar to those in later texts. He briefly addresses the issue of the lives of twins, focusing on the fact that they are born at almost identical times, thus under the same arrangement of the heavens but often have very different lives.<sup>156</sup> Another objection Cicero uses is that of the large distances between the earth and the rest of the celestial spheres. The moon is relatively close, but the other planets are clearly far away. How could they possibly have an effect on individuals on the Earth?<sup>157</sup> This sentiment is also expressed by Geminus, i.e. that it is impossible for any kind of influence from the stars and planets to reach the earth.<sup>158</sup> Following this objection, Cicero then brings up the problem of geography, i.e. that all people born under the same stars throughout the world should have the same horoscope and the same fate, but that is clearly not the case.<sup>159</sup> This is an objection which was used in other polemics, but was also addressed in pro-astrology texts such as Manilius' *Astronomica* and Ptolemy's *Tetrabiblos*. Long explains that Cicero's use of this argument must be due either to ignorance or "as a pure dialectical ploy."<sup>160</sup> Finally, at *De div.* II.96, the concept of an unchangeable fate comes up again. If fate is determined by the stars and cannot be changed, then how would the astrologers explain the "well-known and undoubted fact that many persons who were born with certain natural defects have been restored completely by Nature herself, after she had resumed her sway, or by surgery or by medicine?" Furthermore, men have trained themselves out of their defects, e.g. Demosthenes' inability to pronounce the Greek letter *rho*.

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<sup>156</sup>Cicero/Falconer (trans.). *De div.* II.90.

<sup>157</sup>Cicero/Falconer (trans.). *De div.* II.91.

<sup>158</sup>Long. 1982, 174. See also Geminus. *Isagoge* 17.16, 38.

<sup>159</sup>Cicero/Falconer (trans.). *De div.* II.92-93.

<sup>160</sup>Long. 1982, p. 176.

This should not have been possible if the stars had decreed their physical characteristics. In his complete rejection of astrology, there is no acknowledgment of limited determinism, that it is not all or nothing. In fact, Cicero explicitly states that fate either applies completely or not at all and his attacks on astrology reflect that same antipathy.

Favorinus, a contemporary of Ptolemy, wrote his critique of astrology in much the same vein as Cicero. Unfortunately, only fragments of his works have survived. Aulus Gellius preserved Favorinus' criticisms of astrology in his work *Attic Nights*, claiming to have taken notes during a speech Favorinus made, speaking in Greek. Favorinus' position, as presented by Aulus Gellius, is clear from the beginning, as is Aulus Gellius' own opinion. Astrology is described as a practice of "tricks and delusions" which have been "devised by jugglers and men who made a living and profit from their lies."<sup>161</sup> Favorinus's objections to astrology are similar to those of Cicero. He rejects the claim made by astrologers that the influence of the moon on the tides translates to an effect on human beings. Going further, he states that, even if it could actually be true, no man lives long enough to understand all the details of the movements of the heavens and the stars are so far away that it is impossible that anyone could actually predict the future using a knowledge of their movements, a similar argument to Cicero's in *De divinatione*.<sup>162</sup> One objection he raises against astrology is interesting in that it is not a complaint about the technical parts of astrology. Rather, Favorinus objects to the idea that human beings could know the future because that would "remove the greatest difference between men and gods."<sup>163</sup> Like Cicero, Favorinus also rejects astrology based on geographical issues, from

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<sup>161</sup> Aulus Gellius/Rolfe (trans.). *Attic Nights* XIV.1.2.

<sup>162</sup> Aulus Gellius/Rolfe (trans.). *Attic Nights* XIV.1.3-5.

<sup>163</sup> Aulus Gellius/Rolfe (trans.). *Attic Nights* XIV.1.6.

bringing up the problems of whether or not predictions in one region of the world should apply in the same way to the world as a whole to the fact that the first astrologers based their predictions on observations in only one area and the same stars cannot be seen in every place on the earth.<sup>164</sup>

There are stock arguments Favorinus uses which have already been seen in Cicero's writings and will be seen again both in polemics and in defenses. These include the problem of twins, including the difficulty of similar predictions for large numbers of people, mass deaths, how animals fit into astrological predictions and stellar influence, and the usefulness of foretelling the future as relates to human emotions. This last will be seen more than once in defenses of astrology. Favorinus also links astrologers to magicians and portrays them as frauds intent only on deceit and gaining from that deceit.<sup>165</sup> Again, this is an idea which will come up both in defenses and polemics. For Favorinus, astrology has no redeeming quality and Aulus Gellius concludes his account with a statement by Favorinus that "there is every reason why you should not resort to men of that kind, who profess knowledge of the future."<sup>166</sup>

The Skeptical position on astrology can be seen in the work of Sextus Empiricus. He published his polemic against astrology in the late second century A.D. as a part of his work *Adversos Mathematikos*. In his series of diatribes against various subjects, Sextus Empiricus argued against the possibility of knowing anything at all. He concludes the first chapter of Book I stating that he will prove that "neither does the subject exist nor the teacher nor the learner nor the method of learning: therefore no subject of learning exists."<sup>167</sup> Sextus Empiricus follows his

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<sup>164</sup>Aulus Gellius/Rolfe (trans.). *Attic Nights* XIV.1.8-15.

<sup>165</sup>Aulus Gellius/Rolfe (trans.). *Attic Nights* XIV.1.35.

<sup>166</sup>Aulus Gellius/Rolfe (trans.). *Attic Nights* XIV.1.36.

<sup>167</sup>Sextus Empiricus/Bury (trans.). *Adversos Mathematikos* I.9.



general dismissal with specific polemics against the grammarians, rhetoricians, geometers, arithmeticians, and musicians. In addition, he devotes a book to a rejection the subject of astrology, or more particularly those who professed to practice it.

His first complaint against the astrologers, beyond their use of important-sounding titles, is that they build “a great bulwark of superstition against us” and allow “us to do nothing according to right reason.”<sup>168</sup> Astrology’s effectiveness hangs on its ties to destiny because if fate does not cause every event in every life, then astrology cannot exist because “since some events occur by necessity, some by chance, and some by our action, if the Chaldeans aim at a possible prophecy, they will certainly make their forecasts about events which result either from necessity or from chance or from our action,” and if the predictions are based on necessity, then knowing of the coming event is useless “for it is impossible to avert what happens by necessity whether we like it or dislike it.” However, if the events are based on chance or on human action, they cannot be predicted, again rendering astrology useless and worthless.<sup>169</sup> In addition, if one’s life is determined by the stars present at the time of conception or at birth, an astrologer would have to know the exact moment at which the child was conceived or born, and that is impossible because of the vagaries of the human body and the limitations of human perception. Since the astrologers place so much importance on the exact moment, if they cannot know it, then either they are giving false horoscopes or astrology is false in itself.<sup>170</sup> Continuing with what must have been stock arguments against astrology, Sextus Empiricus also used the example of a man

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<sup>168</sup>Sextus Empiricus/Bury (trans.). *Adversos Mathematicos* V.2.

<sup>169</sup>Sextus Empiricus/Bury (trans.). *Adversos Mathematicos* V.46-48.

<sup>170</sup>Sextus Empiricus/Bury (trans.). *Adversos Mathematicos* V. 55-72.

destined to die at sea.<sup>171</sup> “If he who was born in the pitcher of Aquarius is doomed to suffer shipwreck, how is it that the Greeks who were being brought back from Troy were all drowned together round the ‘Hollows’ of Euboea?” They all could not have been born in the pitcher of Aquarius, but if they were not and it was only one man who was destined to die in a shipwreck, “what reason is there why this man’s destiny overmasters the destinies of them all, rather than that they should all be saved because of one man whose destiny it is to die on dry land?”<sup>172</sup> This example, like his others is focused on an astrology steeped in strict determinism. As it was for Cicero and Favorinus, the astrology rejected by Sextus Empiricus is an all-or-nothing prospect when it comes to predicting one’s fate. Either astrology predicts everything or it predicts nothing. As opposed to the more subtle astrology we will see in Ptolemy’s *Tetrabiblos*, Sextus Empiricus’ arguments are against a crude astrology, similar to the fatalism of found in Manilius’ *Astronomica*, which gives no allowances for uncertainty. Although he brings up other problems beyond those elucidated by Cicero and Favorinus, he is still attacking an astrology that is much less developed than it actually was in the late second century.<sup>173</sup>

Plotinus, a third-century Neoplatonist, in contrast with the previous three examples, was against astrology but not with the same blanket vehemence expressed by a Skeptic like Sextus Empiricus. His difficulties with astrological predictions stem, not from a desire to reject all astrology, but from his desire to preserve human free will and to avoid ascribing evil to the stars. Within his essays, there are three that specifically relate to astrology and the idea of astral

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<sup>171</sup>In *De fato*, beginning at VI, p. 63 in Sharples’ translation, Cicero used a similar prediction “if Fabius has been born with the Dogstar rising, Fabius will not die at sea” and followed it with extended arguments, both philosophical and logical, as to why the statement was patently impossible.

<sup>172</sup>Sextus Empiricus/Bury (trans.). *Adversos Mathematicos* V.92-94.

<sup>173</sup>Long. 1982, p. 186-187.

determinism, *Enneads* 3.1, 4.4, and 2.3 which was the latest work on causation, specifically devoted to the question of whether or not the stars acted as a cause.

Plotinus' student, Porphyry, states that Plotinus was interested in astrology, and the multiple essays dealing with the subject show that this was a "sustained engagement on Plotinus' part" dealing with the stars' connection to the sublunary world and if a science of predicting the future based on the movement of the heavens was even possible. Unlike Cicero, Favorinus, and Sextus Empiricus, Plotinus was much more open to the principle of predicting the future. He was also much more aware of the subtleties which existed in the various types of astrology. His engagement with the topic demonstrates his facility with the issues, and his main objection to astrology is not that the stars can be *signs* of the future, but that they are causes. The philosophical implications of the stars as causes of human events is what Plotinus rejects.<sup>174</sup>

Adamson notes that it is not the stars as signs nor even necessarily the stars as causes per se that gives Plotinus trouble. There are two elements of astrology that he requires in order to support the practice. The first is that of preserving human free will and explaining how human beings can have autonomy if all their actions are dictated by the movements and arrangements of the stars, and the second is the maintaining the divinity of the stars. If the stars cause events in the sublunary world, then they cause both good and evil events, meaning that something divine is the source of evil which cannot happen.<sup>175</sup>

While the other critics of astrology mentioned above looked at only one kind of astrology, Plotinus was willing to look at other variants. For him it was not an all-or-nothing astrology, i.e. that the stars cause every action in the sublunary realm. Rather, he occasionally seemed to

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<sup>174</sup>Adamson. 2008, p. 266.

<sup>175</sup>Adamson. 2008, p. 267.

endorse an astrology in which the stars are signs of the future but not causes. However, this does not adequately represent Plotinus' views. He does not have an issue with all things having some sort of cause. In *Enneads* 3.1, Plotinus states that all things have a physical cause of some sort. He also opens the door to an astrology in which the stars act both as signs *and* as causes of events, but not every event, and they do not eliminate free will.

Astrology gives what is ours to them, deliberations and emotions, vices and impulses, giving us nothing and leaving us as stones that are moved, instead of men who have a function which is their own and comes from their own nature.<sup>176</sup>

In *Enneads* 4.4 Plotinus again addresses the problems of astrology in relation to the soul. As mentioned before, it is the idea that the divine stars would bring about evil acts that is the problem. Adamson describes his intentions in this section as an attempt to develop an astral theodicy and absolve the stars of any blame for evil in the sublunary realm.<sup>177</sup> As many others do, Plotinus is more than willing to concede direct causation in some areas of astral influence, including the effects of the sun on temperature and the seasons, but the stars cannot directly cause evil acts. This of course leaves Plotinus with the problem of where causation comes from and if the stars are signs, why they are signs. His explanation is a Platonic idea of *sumpatheia* or the idea that the universe is one living thing and everything within it are simply parts of the whole.<sup>178</sup>

His criticisms of astrology are seen best in *Enneads* 2.3 which is one of his later essays. Plotinus' views on astrology, his interpretation of what is valid and invalid come in this section. He rejects the idea that virtue could be caused by the stars and that the stars could be causes for

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<sup>176</sup>Plotinus. *Enneads* 3.1.5.16-20. Quoted in Adamson. 2008, p. 270.

<sup>177</sup>Adamson. 2008, p. 275.

<sup>178</sup>Adamson. 2008, pp. 275-276.

everything in the sublunary realm. He also, again, rejects the perception that the stars could be deliberately affecting the earth.<sup>179</sup> His final decision on how astrology *could* work can be found in 2.3. We get our souls from the stars as well as “our moral characters, our characteristic actions, and our emotions, coming from a disposition which is liable to emotion. So what is left which is ‘we’? Surely, just that which we really are, we to whom nature also gave power to master our passions.”<sup>180</sup> The stars clearly can cause sublunary events, but not every sublunary event, and human beings have mastery over their own passions. Using aspects of Stoic philosophy, referring again to the principle of *sumpatheia*, he states that those who do not live to the potential of their soul are controlled by fate, “drawn along together with the whole of which he is a part.”<sup>181</sup>

What is important to see in Plotinus’ critique of astrology is that, although he is coming at it from a different perspective, he is presenting an astrology that is much more easily defended than the type of astrology rejected by his predecessors. He states that the stars are not the only physical causes for events, and physical causes are not the only things that determine what happens because there are aspects of the human soul which are beyond being determined. It is only astrology in this form that he can accept. Anything else must be rejected as invalid, particularly any type of astrology that would tarnish the divinity of the stars.

Within these polemics, it is possible to see some common themes. Rejection of astrology was generally based on a few principles which come from aspects of astrology itself rather than outside complaints. The problem of physical and astrological twins as well as geographical variations in horoscopes is something brought up by three of the four critics above. The

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<sup>179</sup>Adamson. 2008, p. 281.

<sup>180</sup>Plotinus/Armstrong (trans.). *Enneads* 2.3.9.10-16. Quoted in Adamson. 2008, pp. 282-283.

<sup>181</sup>Plotinus. *Enneads* 2.3.9.27-31. See also Adamson. 2008, pp. 284-285.

impracticality of knowing all the details of the movements of the stars, particularly when repeated cycles take place over such a long period of time can be seen in Favorinus, and other astronomical problems are mentioned by Cicero and Sextus Empiricus. Cicero and Favorinus both reject astrology with the argument of its uselessness. All four critics spend time with the problem of determinism. Many of the same ideas are brought up by defenders of astrology as well, in spite of the fact that astrologers rarely mention specific critics, but the trend of defending some of these aspects of astrology continues from Antiquity up through the Middle Ages. While the exact details often change over time and in different civilizations, the basic strategies of defense stay the same. Those defenses are based on the astrological work of Ptolemy, the *Tetrabiblos*. He engages with the common methods of attacking and the astrology he ends up promoting and defending bears remarkable similarities to that of Plotinus.

### 1.12 Defenses of Astrology

Ptolemy was not the only scholar to take time to defend the art. His younger contemporary, Vettius Valens, also devoted space to discussing the dangers facing those who practiced astrology. These statements are not confined to an introduction, however. The structure of *Anthologiae* is such that the nine books were composed over a period of approximately twenty years and not in the order in which we now have them.<sup>182</sup> Joanna Komorowska suggests that Books VI and VII could be independent works which have been combined with the *Anthologiae* over time.<sup>183</sup> The result of this is that many elements which Vettius Valens uses to defend the practice of astrology and to raise it to the level of a divine art are found spread throughout the *Anthologiae* as a whole. Books V and IX of Vettius Valens' *Anthologiae* both contain remarks on

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<sup>182</sup>Riley, Mark. 1996, pp. 5-6.

<sup>183</sup>Komorowska. 2004, pp. 93, 98-99.

the dangers posed by those who are ignorant of astrology and yet pretend to practice it as well as those who intentionally set out to deceive.<sup>184</sup> Where Ptolemy chose to lay out his philosophical foundations almost exclusively in the first three sections of Book I, Vettius Valens begins his philosophical discussions in Book V in which he lays out his methodology and his understanding of predestination.<sup>185</sup> In his discussion of the role of Fate, Vettius Valens explains that “As a result, those ignorant of the prognostic art—or those not willing to engage in it at all—are led away and enslaved to these previously mentioned gods. They endure all blows and suffer punishment along with their pleasures.” In contrast, those who choose to pursue mastery of the art “and in the truth keep their minds free and out of bondage; they despise Fortune, do not persist in Hope, do not fear death, and live undisturbed. They have trained their souls to be confident.”<sup>186</sup> He believes in a Fate which is incontrovertible, and the benefits come from knowing one’s fate without any perception of being able to change that fate. In Book IX, the final book of the *Anthologiae*, Vettius Valens begins with a brief note about his worthiness for laying out these details of astrology, comparing his attempt versus that of Critodemus, whom he calls “very wise.”

I on the other hand in my previously compiled books, have composed an oeuvre which does not consist of vain and empty babble, nor have I included questionable solutions using someone’s mere opinion or purely qualitative non-numerical writings. Approaching what seemed to be the truth, he <Critodemus> wandered off into endless inquiry and criticism. One who wishes to write treatises must <proceed> as if wishing nothing else; if he does <have ulterior motives>, he will import error into his work because of his ignorance and spite. Therefore having traversed the sea and having crossed many lands, I have surveyed many climes and nations, have been plunged in long toil and trouble, finally to be thought worthy by God of attaining secure foreknowledge and a safe

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<sup>184</sup>Komorowska. 2004, p. 82.

<sup>185</sup>Komorowska. 2004, pp. 82-83.

<sup>186</sup>Vettius Valens/Riley (trans.). *Anthologiae*, V.6, p. 102.

harbor.<sup>187</sup>

Although Critodemus “approached” the truth, he was not focused on what was most important. Vettius Valens has presented sure facts and has done so without ulterior motives, with the result that he has succeeded in writing something making him “thought worthy by God.” This claim to worthiness can be seen in IX.12 as well, where Vettius Valens states that he knows the ways of Fate and he is fully-aware of the problems involved in trying to circumvent it. The final result is that he has “kept the laws of Fate.”<sup>188</sup> If Vettius Valens himself is worthy of the art through rigorous study and years of effort, there are many who are not, and he makes a definite division between the genuine practitioners and the frauds. This is especially clear in V.8. The language is dramatic. These frauds have set out to get what they can from the art and then turn on it.

After they have learned from the ignorant and done with enthusiasm what they should not have done, they then enjoy praise and honors, and repay their enemies: they revile honored men, the experienced <astrologers>, on the grounds that they cannot easily make forecasts nor compose treatises in detail.<sup>189</sup>

Beyond his defenses against those who intentionally deride astrology and those who actively condemn it, Vettius Valens gives space to addressing common topics in astrology such as mass deaths and the birth of twins. In doing so and in laying out his views on the practice of astrology, he also makes clear his position on determinism. As mentioned above, Fate, as found in the *Anthologiae*, is absolute. Much like for Manilius, Fate rules the world in Vettius Valens’ astrology. In Book VII, he presents the horoscopes of six men who died in a shipwreck. This relates to the issue of mass deaths and how different horoscopes could lead to the same cause of death. This issue is used, not only to reject it as a source of criticism, but also to bolster Vettius

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<sup>187</sup>Vettius Valens/Riley (trans.). *Anthologiae* IX.1, p. 151.

<sup>188</sup>Vettius Valens/Riley (trans.). *Anthologiae* IX.12, p. 162.

<sup>189</sup>Vettius Valens/Riley (trans.). *Anthologiae* V.8, p. 112.



Valens' views on the power of Fate. By way of introduction, he states that he will use this example to show that "nature is astonishing and that nothing happens apart from the will of Fate—yea, even those lost in wars, collapses, fires, shipwrecks, or any other disaster are altogether governed by Fate."<sup>190</sup> This absolute role of Fate comes up again and again in various arguments. When explaining the differences between those who believe in astrology and those who do not, Vettius Valens describes those who reject the art as "those who enter perfunctorily rapidly come to jeer at this art, because fate has not granted them ready understanding and immortality."<sup>191</sup> Even in discussing the use of oaths, there is an explanation found in the power of the Fates.

Wishing men to keep the laws which they have made, the gods do not nullify the Fates; rather they confirm their effective control of human affairs with unbreakable oaths. For there is among the gods a fearsome and respected oath "By the Styx," an oath which is accompanied by a steady cast of mind and unalterable Necessity.<sup>192</sup>

The gods themselves affirm the absolute power of the Fates in controlling "human affairs." Fate is even "preparing the future" by the various parts of life.<sup>193</sup> The most important reason for studying astrology is to know oneself. Vettius Valens declares that "For this very reason and due to the information derived from my forecasts, I know myself, I know the foundation which my Fate has assigned me, and I know that it is impossible for anyone, contrary to Fate, to become different from what he is."<sup>194</sup>

Vettius Valens' defense, although not presented as a cohesive argument, contains a

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<sup>190</sup>Vettius Valens/Riley (trans.). *Anthologiae* VII.6, p. 134.

<sup>191</sup>Vettius Valens/Riley (trans.). *Anthologiae* IX.9, p. 158.

<sup>192</sup>Vettius Valens/Riley (trans.). *Anthologiae* IX.9, p. 159.

<sup>193</sup>Vettius Valens/Riley (trans.). *Anthologiae* IX.9, p. 159.

<sup>194</sup>Vettius Valens/Riley (trans.). *Anthologiae* IX.12, p. 162.

number of elements common to other defenses. He sets up the principles of his art, shows himself to be a good practitioner and contrasts his intense effort with the frauds who attempt to corrupt the art. As we will see in Ptolemy's *Tetrabiblos*, many of the same aspects of the works coming before, as well as Vettius Valens' treatise which was written later, are used in his defense of astrology.

## Chapter 2

### Ptolemy's Defense of Astrology

The *Tetrabiblos* is one of the more popular presentations of astrology from Antiquity. Its author, Claudius Ptolemaeus, while best known for his treatise on mathematical astronomy, the *Syntaxis Mathematica*, presented a system of astrology that survived from Antiquity through the Renaissance in both the Islamic world and in Europe. The *Tetrabiblos* also contains a defense of astrology which became a model for defenses even outside the Greco-Roman world. His presentation of how astrology worked and why it was useful marked a significant departure from the previous surviving discussions of astrology as seen in the works of Manilius and Cicero wherein the stars either predict and cause every event in the sublunar realm or they predict and cause nothing. Ptolemy's near contemporary, Vettius Valens, while presenting a technical account of astrology, follows the more deterministic type, similar to both advocates, such as Manilius, and polemics, such as Cicero and Sextus Empiricus. Other extant texts, like that of Dorotheus of Sidon, contain no real defense of the practice, focusing instead on the more technical elements of astrology. Ptolemy's account is much more subtle, allowing him to address issues brought up by astrology's detractors and creates a defense which became the foundation for later defenders of astrology.

#### 2.1 Ptolemy's Life and Works

Very few details of Ptolemy's life are known with any certainty. From the dates of observations listed in the *Almagest*, he was active in the mid-second century A.D.<sup>1</sup> The *Suda*, a tenth-century historical lexicon, states that Ptolemy lived during the reign of "king Marcus,"

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<sup>1</sup>Toomer. 2008, p. 186.

referring to Marcus Aurelius.<sup>2</sup> Ptolemy's name reveals that he was likely Egyptian but with Greek ancestors, although not related to the family of the Ptolemaic kings. The name Ptolemy was quite common in Egypt at the time, but because the ruling family had the same name, Ptolemy the astronomer was confused in later centuries with the ruling Ptolemies and he was occasionally depicted as a king.<sup>3</sup> His first name, Claudius, is Roman, meaning that he was a Roman citizen, possibly taking his name from the emperor who granted his family citizenship.<sup>4</sup> Beyond these simple facts, nothing more is known, not of his life, nor of his education. It seems likely that he did most, if not all, of his work in the Roman province of Egypt in or near the city of Alexandria which he specifically mentions as his location for observing the planets, e.g. three eclipses in *Almagest* IV.6 and the moon in *Almagest* V.12.<sup>5</sup> Ptolemy also describes Alexandria as located on "the meridian for which we establish the times of the positions [of the heavenly bodies]."<sup>6</sup> Alexandria, as its name indicates, was founded by Alexander the Great during his fourth-century conquests. From that time until the Arab conquest of Egypt and the founding of Fustat, it served as the capital and became one of the wealthiest and largest cities of the Roman empire. It was also the site of a large library and remained a center of Greek culture and learning during the reign of the Ptolemies. The city was captured by Julius Caesar in 47 B.C. and recaptured by Octavian in 30 B.C. after his defeat of Mark Antony and built up to its former prosperity. By the second century, Alexandria was again a center of learning and culture, aided

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<sup>2</sup>Taub. 1993, p. 7.

<sup>3</sup>See, e.g., North. 2008, p. 108, fig. 59. For more on the belief that Ptolemy was a monarch, see also Burnett. 1998, especially pages 340-342.

<sup>4</sup>Toomer. 2008, p. 187.

<sup>5</sup>Ptolemy/Toomer (trans.). *Almagest*, IV.6 and V.12.

<sup>6</sup>Ptolemy/Toomer (trans.). *Almagest*, II.13.

by its role as a major seaport and thus a center of commerce. The great library and Museum served as ideal locations for research and education. The actual scope of the collections in the library are a matter of debate. The ancient estimates range wildly from 40,000 rolls to 500,000 rolls, all of which are likely exaggerations. Even so, the existence of the library and its grandeur relative to what had previously existed in Antiquity created a situation in which the kinds of scholarly work for which Alexandria was known could be undertaken.<sup>7</sup> In the time of Ptolemy, Alexandria was also acknowledged specifically as a center of astronomical learning. Galen's commentary on Hippocrates' *Airs Waters Places* contains a reference to it. In his paper for the conference on Untrodden Areas in the History of Arabic Science, Gotthard Strohmaier quoted from Galen's work:

For I saw that all men share the opinion that none among the peoples had mastered the astronomy as well and had a knowledge of it like the Egyptians. And if somebody feels an inclination to the study of astronomy and is full of desire for it, let him go to Egypt. At the time when the construction of Alexandria on the shore of the sea was completed, people were rushing there, because it was situated at the seaside and they could go there by ship. Thus a great number of astronomers gathered there.<sup>8</sup>

While little is known about Ptolemy's life, many of his works have survived and titles for others are known.<sup>9</sup> While the *Almagest*, originally titled *Syntaxis Mathematica*, is his most famous work, Ptolemy wrote other books on astronomical topics. Besides the *Tetrabiblos*, his work on astrology (see below), Ptolemy also wrote the *Planetary Hypotheses*, a cosmological work giving a physical description of his conception of the universe, the *Handy Tables*, a set of

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<sup>7</sup>Bagnall. 2002, pp. 357, 360-361.

<sup>8</sup>Galen/Strohmaier (trans.). "Galen's Commentary on Hippocrates' *Airs, Waters and Places*."

<sup>9</sup>Toomer. 2008, p. 201.

tabulated data for calculating planetary positions, the *Phaseis*, a literary paraepigma,<sup>10</sup> the *Planispherium*, a brief treatise on the principle of stereographic projection, and the *Analemma*, a work which demonstrates a method for calculating the position of the sun in spherical coordinates.<sup>11</sup> A definite order of publication is difficult to assert, but based on references in other works, it seems clear that the *Almagest* was one of the earliest of Ptolemy's major works, composed after 146/147,<sup>12</sup> because Ptolemy references it in the *Geography* and the *Tetrabiblos*. Ptolemy's other surviving works on philosophy, geography, optics, harmonics, along with references to lost works on mechanics led Olaf Pedersen to suggest that Ptolemy had "intended to compile a huge 'Encyclopedia of Applied Mathematics' as a counterpart to already existing comprehensive expositions of pure mathematics,"<sup>13</sup> a task at which Pedersen feels he succeeded. However, the comparatively large number of astronomical works indicates that Ptolemy was, first and foremost, an astronomer.

## 2.2 Ptolemy's Philosophy

The philosophy underlying Ptolemy's works has, in the past, been described simply as Aristotelian and there are plenty of reasons for that, not least of which is the fact that Aristotle is

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<sup>10</sup>Literary paraepigmata are formalized systems of astrometeorology indicating the coming weather based on the positions, risings and settings of the stars. See chapter one. See also Lehoux, 2007.

<sup>11</sup>The *Planispherium* survives only in Arabic and Latin translations, and *Analemma* in a few surviving fragments and a Latin translation. Toomer. 2008, pp. 197-198.

<sup>12</sup>The *Canobic Inscription* is dated to AD 146/147 and uses a method of computation which Ptolemy chose to abandon in the *Almagest* in favor of "more elegant methods." See Hamilton, Swerdlow and Toomer. 1987, pp. 55-60. Hamilton, Swerdlow and Toomer also show that in *Almagest*, IV.9, Ptolemy criticizes his own work, regarding it as flawed. Their conclusion is that this apology is due to the fact that he had previously published the rejected method in the *Canobic Inscription*.

<sup>13</sup>Pedersen. 1974, p. 13.

the only philosopher mentioned by name in the *Syntaxis*<sup>14</sup> in the context of his division of theoretical philosophy into the categories of physics, mathematics and theology. Philosophy is divided into the theoretical and the practical branches and these branches each have subdivisions as mentioned above. However, defining Ptolemy simply as Aristotelian ignores the obvious Stoic influence which can be seen in his other works, including *On the Criterion and Hegemonikon* and the *Tetrabiblos* as well as Ptolemy's agreement with Platonic ideas. In addition, genuine Aristotelianism barely existed during this time. Many of the commentaries on Aristotelian works both in Ptolemy's time and especially in the centuries after were undertaken by Platonists who wished to harmonize Aristotle's thought with that of Plato.<sup>15</sup> A full investigation of the complex topic of Ptolemy's thought is a subject which could fill several volumes even though Ptolemy does not spend a great deal of time explaining his philosophical views. Liba Taub argues, in *Ptolemy's Universe*, that rather than being an Aristotelian, Ptolemy was a "mathematician greatly influenced by Platonism."<sup>16</sup> More than that, however, Ptolemy also was a

self-identified philosopher who examined a number of the most pressing philosophical questions of his time, commented on the (lack of) success of previous philosophical theories, appropriated the philosophical concepts of contemporary schools, and, moreover, propounded philosophical ideas unprecedented in the history of ancient Greek philosophy.<sup>17</sup>

Pedersen's description of Ptolemy as predominantly an astronomer does not contradict his interest in philosophy. On the contrary, his interest in astronomy helps explain his philosophical leanings. Knowledge is only certain when it is based in mathematics. Physics and theology are

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<sup>14</sup>Ptolemy/Toomer (trans.). *Almagest*, I.1.

<sup>15</sup>Sorabji. 2007, p. 11. For an in-depth look at this attempt to harmonize the philosophy of Plato and Aristotle, see Karamanolis, 2006.

<sup>16</sup>Taub. 1993, p. 152.

<sup>17</sup>Feke and Jones. 2011, p. 197.

both based on foundations which cannot lead to knowledge. Physics relies on changeable matter while theology has a nature that is “completely invisible and ungraspable.”<sup>18</sup> Mathematics, when pursued carefully, leads to indisputable knowledge, even to the point that mathematics can be applied to other fields to gain knowledge. The preeminence of mathematics is certainly Platonic in nature, but Jacqueline Feke argues that the “identification of mathematics with knowledge appears to be unique to Ptolemy.”<sup>19</sup>

Ptolemy’s interest in and near devotion to mathematics is part of Taub’s reasoning for making Ptolemy a Platonist at heart. In the opening chapters of the *Syntaxis*, Ptolemy discusses the importance of mathematics as a subject which can lead to a moral life. In a particularly Platonic statement, Ptolemy says that he is attempting to order the text he is writing

in such a way as never to forget, even in ordinary affairs, to strive for a noble and disciplined disposition, but to devote most of our time to intellectual matters, in order to teach theories, which are so many and beautiful, and especially those to which the epithet ‘mathematica’ is particularly applied.<sup>20</sup>

In addition, astronomy is an important part of education in Platonic ethical philosophy, meaning that it is not only a good thing but a necessity to know and understand astronomical topics.

Elements of Plato’s interest in astronomy as a step on the path to imitating the divine can be seen in his *Republic*, *Laws*, and *Timaeus*.<sup>21</sup> It is astronomy’s link to mathematics that makes it such an important subject. In the *Tetrabiblos*, Ptolemy describes astronomy as a subject which is “desirable in itself” even without the same kinds of applications which can be found in

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<sup>18</sup>Ptolemy/Toomer (trans.). *Almagest*, I.1.

<sup>19</sup>Feke. 2009, p. 15.

<sup>20</sup>Ptolemy/Toomer (trans.). *Almagest*, I.1.

<sup>21</sup>Taub. 1993, pp. 147-150.



astrology.<sup>22</sup>

The Platonic elements in Ptolemy's thought do not negate the Aristotelian nature of his philosophy, however. The tripartite nature of his philosophy is Aristotelian at its heart, even if it is not strictly Aristotelian in definition. Ptolemy follows Aristotle's cosmology and, although he redefines Aristotle's divisions, as Feke and Jones argue, his new definitions still have a foundation in Aristotle's theory of perception.<sup>23</sup> In *On the Criterion*, Ptolemy asserts an Aristotelian empiricism in his description of intellect. "Through memory, not of the Forms but of sense impressions and concepts developed in relation to them, intellect has the ability to pass judgment on both sense perception and the objects perceived."<sup>24</sup> Knowledge comes from the use of intellect, applied to the subject. This fits with Ptolemy's criterion of truth as framed in *On the Criterion* and his presentation of knowledge in the *Almagest* shows a similar dependence upon sense perception.<sup>25</sup>

Even so, Ptolemy's thought cannot be described simply as Platonic or Aristotelian. In addition to the elements of those two schools already mentioned, the presence of Stoic principles are also seen in various works, most especially in the *Tetrabiblos*. As will be shown below, aspects of Ptolemy's defense of astrology have definite Stoic aspects including the idea of a nexus of causes all connected to each other and the importance of studying astrology in order to allow one to greet whatever comes with a calm and collected mind. Although these Stoic influences are not as prominent as the Aristotelian or Platonic elements, they are a definite part of

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<sup>22</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.1.

<sup>23</sup>Feke and Jones. 2011, p. 203.

<sup>24</sup>Feke. 2009, p. 50.

<sup>25</sup>Feke. 2009, pp. 55-56.

his philosophical ideas, which fits with the contemporary philosophy of the Middle Platonists. Instead of characterizing Ptolemy as an Aristotelian, both Feke and Taub present him as a scholar who was affected by the dominant philosophy of his time, i.e. an eclectic blend of many diverse philosophical and religious ideas and a time of an attempt to fully reconcile conflicting schools of thought.<sup>26</sup> His access to various philosophical works is unknown, but his own writings demonstrate some familiarity with ideas espoused by Aristotle, Plato and possibly those of the Stoic Posidonius.<sup>27</sup>

### 2.3 *Tetrabiblos*

The title of the work commonly referred to as the *Tetrabiblos* is not known for certain. *Tetrabiblos* is the shortened form of a longer title of Μαθηματικὴ τετράβιβλος σύνταξις or the “Mathematical treatise in four books” found in some manuscripts. Robbins suggests that the more common title found in manuscripts, Τὰ πρὸς Σύρον ἀποτελεσματικά, meaning “The prognostics addressed to Syrus” was the original title used by Ptolemy.<sup>28</sup> In the preface to his 1998 edition, Hübner notes the wide range of titles given to Ptolemy’s astrological text both in Antiquity and in modern times. Most of the manuscripts contain Τετράβιβλος (Latin: Quadripartitum) while others contain ἀποτελεσματικά. Porphyry’s introduction to the *Tetrabiblos* contains the title Εἰσαγωγὴ εἰς τὴν Ἀποτελεσματικὴν τοῦ Πτολεμαίου.<sup>29</sup> Hübner chooses, “post haesitationem constitutum,” to follow E. Boer in using Ἀποτελεσματικά as the

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<sup>26</sup>Taub. 1993, p. 13. Feke. 2009, pp. 66-67.

<sup>27</sup>Pedersen. 1974, pp. 31, 401-402. Taub points out that there are considerable difficulties in determining what, if any, influence Posidonius’ works may have had on Ptolemy since none of them are extant. In addition, the fragments are of uncertain attribution and occasionally do not correspond to original Stoic doctrine. See Taub. 1993, pp. 15-16.

<sup>28</sup>Robbins. 1940, pp. x-xi.

<sup>29</sup>Hübner. 1998, p. XXXVIII.

title.<sup>30</sup> While acknowledging the uncertainty of the appellation, I will use the common title of *Tetrabiblos* to refer to Ptolemy's work.

The text was composed after the *Almagest* and makes reference to it, although not by name. Beyond that, the exact date of publication is not known. A number of commentaries and adaptations of the *Tetrabiblos* were composed in Late Antiquity, many of which have not survived but are mentioned in extant writings. Robbins mentions one by the name of Pancharios whose name is preserved, but none of his commentary beyond a few quotations has survived.<sup>31</sup> In addition, there is an anonymous commentary which is generally attributed to Proclus along with the famous *Paraphrase*, and an introduction which is attributed to Porphyry. Hephastio's *Apotelesmatika*, written in the fifth century A.D., also contains extensive quotations from the *Tetrabiblos*.<sup>32</sup> The *Tetrabiblos* was translated into Arabic early in the translation movement in Baghdad, first by al-Bitrīq and then again by Ibn al-Ṣalt. That translation was revised by Hunayn ibn Ishāq and the text was commented on numerous times.<sup>33</sup> Although it was popular in the Islamic world, it never gained quite the reputation of the *Almagest*, possibly because it did not address the popular catarchic astrology, and thus was surpassed by other original Arabic works.<sup>34</sup> In medieval Europe, the Greek text was only printed three times in the sixteenth century. It enjoyed much more popularity in Latin translations, the earliest of which was made by Plato of Tivoli in 1138 and followed by two thirteenth-century translations by an anonymous translator

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<sup>30</sup>Hübner. 1998, p. XXXIX.

<sup>31</sup>Robbins. 1940, p. xvi. See also Boll. 1894, pp. 127-131.

<sup>32</sup>Robbins. 1940, p. xvi. See also Sarischouli. 2006, p. 183, note 5.

<sup>33</sup>Gutas. 1998, p. 109. See also chapter 3.

<sup>34</sup>Toomer. 2008, pp. 198, 202.

and Aegidius de Thebaldis.<sup>35</sup>

The text itself is organized, as its title indicates, in four books. Book I contains the introduction and Ptolemy's defense of astrology. In addition, Ptolemy gives an overview of the basic parts of astrology, i.e. "the most important details of the tabular exposition needful for the inquiry into particular prognostications."<sup>36</sup> Ptolemy divides astrology into particular, or individual, and general, or universal. The general signs are those which have effects on areas or groups of people and have the most power to affect an individual. The particular are those which affect only the individual native and are less certain. Book II focuses on the characteristics of general astrology, and his reason for this is that "since weaker natures always yield to the stronger, and the particular always falls under the general, it would by all means be necessary for those who purpose an inquiry about a single individual long before to have comprehended the more general considerations."<sup>37</sup> Book III is an investigation of the elements of casting a nativity for an individual, i.e. the events which come before, during and after birth. He includes aspects of physical appearance, tendency to illness both of body and soul, how the native is raised, etc. Book IV closes with what Ptolemy calls the "external accidentals,"<sup>38</sup> i.e. those things which are predicted that are not of the body or soul, e.g. wealth and honor. There are two different conclusions to the text as found in the manuscripts. Robbins supplies both as found in *Parisinus* 2425 and in three manuscripts in addition to the Camerarius edition. He favors the *Parisinus* conclusion because it seems to fit better with the style in which Ptolemy writes. The other, he

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<sup>35</sup>Robbins. 1940, pp. xiv-xv. See also Heilen. 2010, p. 70.

<sup>36</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, II.1.53.

<sup>37</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, II.1.54.

<sup>38</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, IV.1.173.

attributes to Proclus' *Paraphrase* although Camerarius used it in both editions.<sup>39</sup> Hübner takes just the opposite stance, preferring the Camerarius because the phrasing seems to be in Ptolemy's style, again following Boer.<sup>35</sup> Both conclusions are short passages summarizing the preceding text.

Reading through Ptolemy's presentation of astrology in the *Tetrabiblos* reveals one fact very clearly. As is the case with most of the surviving astrological handbooks in Antiquity, this is not a text to be used in the actual practice of astrology. As with the later work by Firmicus Maternus, one could not cast a horoscope with only the *Tetrabiblos* to hand. Even with a set of astronomical tables available for use, casting a horoscope using Ptolemy's text would be difficult if not impossible. This is not a weakness to the text, however, because it is not Ptolemy's intention to give a guidebook to practicing astrology. Unlike his near contemporary, Vettius Valens, Ptolemy's intention is not to teach the practical side of astrology, although even Vettius Valens' text contains little of the actual process of practicing astrology. There are no sample horoscopes provided in the *Tetrabiblos* while Vettius Valens gives hundreds. As such, Ptolemy is also more impersonal in his presentation than Vettius Valens whose ardent belief in astrology is obvious in his text, *Anthologiae*. Ptolemy's intention in the *Tetrabiblos* is not to convert people to believe in astrology but rather is to present the theories underlying it. This is clear throughout the text as he provides very little hard data, i.e. detailed tables and mathematics as one finds in the *Almagest*. One exception is found at the end of Book I with Ptolemy's description of the terms. Although the terms are not generally considered as important as other aspects of making an astrological prediction, Ptolemy devotes more time to this concept than to almost any other of

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<sup>39</sup>Robbins. 1940, p. 459, n. 1 and 2.

<sup>35</sup>Hübner. 1998, p. XXXIX.

the planetary dignities described in the *Tetrabiblos*.<sup>36</sup> He compares those used by the Egyptians and Chaldeans to a set of terms he claims to have found in “an ancient manuscript, much damaged, which contains a natural and consistent explanation of their [the terms’] order and number” and in doing so, he presents the degrees of the various terms for each system.<sup>37</sup> Heilen attributes this attention to detail to Ptolemy’s intention of creating a more rational system of astrology. In a rare moment of critique, Ptolemy complains that the Egyptian and Chaldean systems of the terms does not “preserve the consistency either of order or of individual quantity” and that the numbers for the planets “furnishes no suitable or acceptable argument.”<sup>38</sup> When he describes the system he discovered, he states that the text was damaged but it contains a “natural and consistent explanation of their order and number,”<sup>39</sup> i.e. that this is a system which is far superior to the traditional systems because there is consistency, terms that can be rationally explained. In fact, it appears that Ptolemy created the system of terms he claimed to have found and that he fabricated the discovery of the ancient text purporting to contain the system he preferred.<sup>40</sup> The commonly-used Egyptian system was without any clear, rational basis and Ptolemy needed to show a method that would follow a rational path and yet still fit in with the requirements of astrological prognostication.<sup>41</sup> Because of his need for rationalizing an often-mystical practice, Ptolemy’s attention to the terms makes sense in the context of the more

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<sup>36</sup>Heilen. 2010, pp. 45-46.

<sup>37</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.20-21.43-49.

<sup>38</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.20.43.

<sup>39</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.21.47.

<sup>40</sup>Heilen. 2010, pp. 51-52.

<sup>41</sup>Heilen. 2010, p. 77.

theoretical presentation one finds in the *Tetrabiblos*.

## 2.4 Ptolemy's Defense of Astrology

Ptolemy's defense is not necessarily particularly in-depth, but it does lay the groundwork for many later scholars, both in the Islamic world and in medieval and Renaissance Europe. His method of defending astrology is much more subtle and nuanced than the extant works which preceded the *Tetrabiblos*. In the first chapters of Book I of the *Tetrabiblos*, Ptolemy lays out his defense. Before looking at those parts in detail, it is worth mentioning some of the underlying assumptions Ptolemy brings to his work. In the *Almagest*, he devotes much of Book I to explaining the foundation of his model, including the Aristotelian geocentric cosmos, the spherical motion and nature of the heavens, the overall size of the cosmos, etc., along with the more philosophical foundations of his tripartite division of philosophy and the preeminent place he gives to mathematics. In the *Tetrabiblos*, there are similar assumptions being made, but Ptolemy does not take the time to state them explicitly. Instead, these assumptions are found as he lays out his defense. As in the *Almagest*, Ptolemy is giving mathematics the highest position in leading one to knowledge. This is a stand that can also be seen in Book I of his *Geography* where he speaks of astronomy and the cosmos as things that “belong to the loftiest and loveliest of intellectual pursuits, namely to exhibit to human understanding through mathematics [both] the heavens themselves...and [the nature of] the earth...”<sup>42</sup> The exaltation of mathematics as that which leads to sure knowledge is especially applied to the study of the stars. This is obvious in his division of astronomy and astrology in I.1. At the bottom of his hierarchy is physics which he describes as being “unstable and unclear” and thus qualifying more as “guesswork than

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<sup>42</sup>Ptolemy/Berggren and Jones (trans.). *Geography*, I.1, p. 59.

knowledge.”<sup>43</sup> In addition, Ptolemy makes use of ideas that are widely known in the Greco-Roman world, e.g. the effects of the heavens on tides, the use of stars and planets in astrometeorology, as well as non-celestial things like the widely-known and believed idea that garlic would demagnetize a lodestone. All these are brought up and used without any apparent worry that they will be criticized. Finally, there is an assumption that people will agree that there is a connection between the celestial and terrestrial realms. Ptolemy does not take time to explain that this is true. It is something he takes for granted as will be seen below. All these assumptions lead to the question of who would have been convinced by Ptolemy’s argument. Certainly, a Skeptic such as Sextus Empiricus would likely not be convinced, but is that Ptolemy’s intention? The overall tone of the defense is not one that is geared toward a direct debate with critics, but rather, it seems as though Ptolemy is speaking to an audience already inclined to agree with him on the general stance. He is presenting astrology, but in the guise of a new method and a new way of thinking about it. He is not fighting for the acceptance of astrology but for the acceptance of his rational approach to astrology.

As for the defense itself, it is laid out in four parts, roughly corresponding to the first three chapters of Book I. The first is how he defines his astrology. This is a necessity since there is such a wide range of interpretations of the movements of the heavens, and Ptolemy takes the time to be precise about what he thinks of as being astrology proper although he does not use that particular term. The methods he uses in the rest of his defense become common practice in the works of later scholars both in the medieval Islamic world and in medieval Europe. The definition of astrology leads to the main defense which begins with a brief discussion of how and why astrology works. The third part of Ptolemy’s defense of astrology is that of the benefits of

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<sup>43</sup>Ptolemy/Toomer. *Almagest*, I.1.



practicing it. These are the three explicit sections, but woven throughout the work as a whole and the defense in particular is Ptolemy's view of determinism, and this is what I will treat as the fourth part of his defense of astrology because of the controversial nature of the idea in general and because of its importance in later defenses.

## 2.5 The Definition of Astrology

As mentioned above, Ptolemy does not use the term ἀστρολογία in speaking of astrology. Instead, he calls it one of the two means of τὸ δι' ἀστρονομίας προγνωστικόν and defines it as the study of the way in which the planets bring about changes in “that which they surround,” i.e. the sublunar realm.<sup>44</sup> Thus, he is presenting the planets as a definite cause, something that influences the terrestrial realm. It is interesting to note that he includes prediction of the type found in the *Almagest* as the other “means of prediction through astronomy,” i.e. predicting the motions of the planets “in relation to each other and to the earth.”<sup>45</sup> This type is what is now defined as astronomy and for Ptolemy is “first, both in order and effectiveness.”<sup>46</sup> Though related to astrology, astronomy stands above it as a type of knowledge which is more accurate and more able to reveal information on the universe. For Ptolemy, astrology is real but more fuzzy in its methods and results. One investigating it “ascribes to it the weakness and predictability of material qualities [i.e. the sublunar world]” but must accept that astrology is possible because “it is so evident that most events of a general nature draw their causes from the enveloping heavens.”<sup>47</sup>

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<sup>44</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.1.

<sup>45</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.1.

<sup>46</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.1.

<sup>47</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.1-2.

In the *Tetrabiblos* Ptolemy describes a practice which is not a perfectly clear-cut science. Where astronomy's results are such that "the allegations against the first [astronomy] could be made only by the blind," the difficulty in understanding astrology has invited criticisms of complete incomprehensibility and disparaging claims of uselessness.<sup>48</sup> For this reason, Ptolemy says, he is going to explain both that astrology is possible *and* that its practice is useful. This defense is not without certain caveats. From the beginning of the *Tetrabiblos*, Ptolemy acknowledges the inherent weaknesses of astrology. It is not as good as astronomy in terms of accuracy and cannot operate without the aid of astronomical data.<sup>49</sup> Perhaps most importantly, is the nature of the terrestrial world which affects the surety of what can be known. Although he does not address it explicitly within the *Tetrabiblos*, in the beginning of the *Almagest*, in his discussion of the division of theoretical philosophy, Ptolemy speaks of physics, i.e. that part of philosophy which looks at nature or *phusis*, as a subject which should "rather be called guesswork than knowledge...because of the unstable and unclear nature of matter."<sup>50</sup> Unlike astronomy which is based in the celestial world and described by mathematics, astrology is the study of influences from the celestial world on the sublunar, and changeable, realm. In relation to this, Ptolemy acknowledges the presence of other influences in the life of a native which are able to impact the course of his life. "But in an inquiry concerning nativities and individual temperaments in general, one can see that there are circumstances of no small importance and no trifling character, which join to cause the special qualities of those who are born."<sup>51</sup> It is clear that

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<sup>48</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.2.

<sup>49</sup>Ptolemy. *Tetrabiblos*, I.1.1 and I.2.5. See also, Lehoux. 2006, p. 108.

<sup>50</sup>Ptolemy/Toomer (trans.). *Almagest*, I.1.

<sup>51</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.8.

Ptolemy believed that the stars are not merely signs but are the *causes* of events here on earth, not the *only* causes, but the preeminent cause. Even with the complications, it is still worth the effort to study because “When [the claims] are divine, we should welcome what is possible and think it enough.”<sup>52</sup> Within its limitations, astrology is a valuable and worthwhile tool.

## 2.6 Why Practice Astrology?

Having elucidated astrology’s limitations, Ptolemy is not through with his defense. By acknowledging the fact that astrology can still lead one to error, Ptolemy now has to defend the validity of practicing astrology at all. This he does by giving a plausible explanation and by using arguments which must have been common even to Cicero two centuries before: because celestial objects have obvious general effects on the earth, why not particular effects as well? “For the sun, together with the ambient, is always in some way affecting everything on the earth,” such as the changing temperature, the passing seasons and even the breeding of animals. In addition, the moon, “as the heavenly body nearest the earth, bestows her effluence...” most particularly on the waters, based on the various phases. The other planets and fixed stars also “signify hot, windy, and snowy conditions of the air, and mundane things are affected accordingly,” a clear reference to astrometeorology.<sup>53</sup> Weather and tides are not the only things commonly determined by observation. Besides those more-easily-accepted ideas, farmers and herdsmen use various traditions and experiences to know when crops will grow and when animals will bear offspring. Beyond those occupations, sailors use the stars to guide them in navigation as well as signals of coming storms.

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<sup>52</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.9.

<sup>53</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.3. The fixed stars, i.e. the outermost sphere in the geocentric universe, were the more common method of prediction used in Greek astrometeorology as seen in the *paraegmata* tradition. See chapter 1.

Clearly, stars are useful as guides in many aspects of life. The problems arise, not because the stars have no effect, but because of human error and the limits of human knowledge. “Yet because they cannot in their ignorance accurately know the times and places of these phenomena, nor the periodic movements of the planets, which contribute to the effect, it happens that they often err.”<sup>54</sup> Ptolemy sees the main weakness to be, not the stars themselves, but the uneducated who observe them. He describes the knowledge of farmers and sailors and herdsmen as being due, not to knowledge of the laws of nature but rather simply to observation,<sup>55</sup> with the implication that it is the lack of education which leads to error. He makes this requirement more explicit as his explanation continues.

If, then, a man knows accurately the movements of all the stars, the sun, and the moon, so that neither the place nor the time of any of their configurations escapes his notice, and if he has distinguished in general their natures as the result of previous continued study...what is to prevent him from being able to tell on each given occasion the characteristics of the air from the relations of the phenomena at the time, for instance, that it will be warmer or wetter?<sup>56</sup>

Ptolemy keeps the predictions to that of the air and the weather rather than to human beings at first, dwelling on the effects of the sun, moon and planets on the elements of the earth, which was widely accepted, rather than on mankind, which was more controversial. In addition, Ptolemy asks questions in order to present something he seems to feel is obvious, although his proof for it is not as sure as he makes it out to be. However, after assuming agreement about the weather and how, if a man knows exactly the details of the movements of the heavens, he can predict the changes of the air, Ptolemy then extends his question, quickly making a shift from

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<sup>54</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.5.

<sup>55</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.4. Greek: μὴ φυσικῶς, μόνον δὲ παρατηρητικῶς.

<sup>56</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.5.

weather to human beings. “Why can he not, too, with respect to an individual man, perceive the general quality of his temperament from the ambient at the time of his birth?”<sup>57</sup> Astrology works because of the link between the heavens and the earth, but because there are many who do not really understand the science, they err and lead many people astray. In addition, there are those who deliberately pretend to know the art with the sole intention of making money. Human error and human deception, although they make the validity of astrology more difficult to discern, are not reasons to dismiss the art all together.

Astrology, in Ptolemy’s view, is a very complicated science, one that is based, not simply on easily-predictable motions, but also on terrestrial interventions. This added complication means that the predictions will sometimes be incorrect, even with a perfect knowledge of the movements of the celestial objects, which is also impossible. Astrologers base their predictions upon an assumption that the heavens move with constant repetition, even at very long intervals. One such concept is that of the Great Year, i.e. the amount of time it takes for all the planetary spheres to come into conjunction with the sphere of the fixed stars. In western thought, this concept is first found in Plato’s *Timaeus* and is called the Perfect Year by Plato himself.<sup>58</sup> The ideal event would see all seven planets aligned with one point on the eighth sphere, but the actual application was often less rigorous. This idea was tied in with the concept of time being cyclical and that the celestial bodies were made to “define and preserve the numbers of time.”<sup>59</sup> The Stoic theory of the conflagration as well as their strict determinism has been linked to the Great Year. Critics of Stoicism took these theories to ridiculous extremes, but at their foundations, the early

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<sup>57</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.6.

<sup>58</sup>De Callataÿ, Godefroid. 1996, pp. VIII-IX.

<sup>59</sup>Plato/Cornford (trans.). *Timaeus*, 39c. As quoted in De Callataÿ. 1996, p. 3.

Stoics did use the Great-Year concept in their perception of cyclical destruction and rejuvenation.<sup>60</sup> In astrology, celestial cycles gave a starting point for justifying the various effects the planets and stars have on the terrestrial world. Endlessly-repeating cycles would stand as evidence for the claims of understanding how the planets affected the sublunar realm. The understood definition of this Great Year varied considerably from the fragments of the work of Berossus of Cos to the writings of Nechepso and Petosiris. In the fourth century A.D., Firmicus Maternus would describe the alignment as each planet being in the fifteenth degree of a sign of the zodiac.<sup>61</sup>

However, in contrast, Ptolemy allows that this complete revolution may actually occur, but “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.”<sup>62</sup> A complete revolution of the entire cosmos would mean that the same celestial events would cause the same terrestrial events. One of the justifications for the possibility of predicting the future based on the movements of the heavenly bodies is that there is repetition in those movements which creates a similar effect to that which has been observed and recorded. Ptolemy agrees that these movements are similar but they are not exactly the same which is what contributes to the inaccuracies found in predictions based on ancient records.<sup>63</sup> If one is only looking at the atmosphere, the only difficulty in making a prediction is that inaccuracy found in the records, but when the prediction is made for a human being, there are many other factors that

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<sup>60</sup>De Callataÿ. 1996, pp. 59-66.

<sup>61</sup>De Callataÿ. 1996, pp. 72-73.

<sup>62</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.7.

<sup>63</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.7.

are involved, including the time of the year in which a birth takes place and the region in which a child was born because various regions receive different influences from the heavens. As important as those regional and atmospheric differences are, Ptolemy, like Cicero, attributes many differences between people of similar origins to how a child is brought up, claiming that “all the aforesaid conditions being equal, rearing and customs contribute to influence the particular way in which a life is lived.”<sup>64</sup> Ptolemy separates physical causes from celestial causes, rather than insisting that all causes can be reduced to a celestial motion. There are genuine physical causes such as the inherent nature of an animal or plant or human being. These will be influential if all other things are equal.<sup>65</sup> Everything has to be considered in order to have a chance of accurately predicting the life of a nativity. However, this is not a reason to dismiss astrology, rather it is a reason to approach it carefully and not “demand everything of the art, but rather join in the appreciation of its beauty, even in instances wherein it could not provide the full answer.”<sup>66</sup> As will be discussed below, this has great implications for how Ptolemy views the nature of determinism and what causes exist in the interaction between the heavens and the earth.

## 2.7 The Benefits of Astrology

The third piece of Ptolemy’s defense of astrology is his presentation of the usefulness of astrology, i.e. that it is beneficial. His explanation sounds very similar to the Stoic justification of astrology as related by Manilius. Ptolemy claims

For if we look to the goods of the soul, what could be more conducive to well-being, pleasure, and in general satisfaction than this kind of forecast, by which we gain full view of things human and divine? And if we look to bodily goods, such knowledge, better than anything else, would perceive what is fitting and expedient for the capabilities of each

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<sup>64</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.8.

<sup>65</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.8.

<sup>66</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.9.

temperament.<sup>67</sup>

Learning what lies in the future can only make one better because one will understand the divine, not just the mundane. Astrology aids in gaining a better grasp of the reality of the universe and thus is beneficial in a general sense, but that is not all. It also aids in ascertaining what kinds of bodily goods are appropriate for each person through a knowledge of what comes in the future for an individual. In fact, if one wishes to reject astrology, as Cicero did in *De divinatione*, on the grounds that it brings nothing of material value, then, one should also reject every part of philosophy because neither does it bring the kind of measurable benefits that astrology's attackers used to denigrate the science. This statement about the non-material benefits of astrology fits in well with that of Manilius; however, Ptolemy's similarity with Manilius mostly ends at this point, particularly, as will be shown, in his views on determinism.

The final section of Ptolemy's defense contains a series of comparisons of astrology with other types of knowledge to show how even without perfect accuracy, astrology is as valuable as other accepted practices. He focuses mainly on medicine as a parallel science to astrology, but also mentions mining, sailing and breeding and refers to the type of astrometeorology seen in Hesiod's *Works and Days* as well as the parapegma tradition.<sup>68</sup> These are not illustrations of reliance on astrology but on the idea of prediction and amelioration being possible when one knows what is coming through experience. For Ptolemy, it is important to point out that prediction of the future is something that happens in many areas of study and in many venues. In this case, he is using things that everyone knows in order to give support to his ideas. In the list of ideas he gives, one of the more interesting is the lodestone. In Antiquity, it was commonly

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<sup>67</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.3.10.

<sup>68</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, 1.3.13-16.



believed that a lodestone attracts iron, but if it is rubbed with garlic, it will no longer do so. In the same way, a sore will spread if it does not receive treatment, but once treatment is applied, the sore will heal.<sup>69</sup> What is interesting about these examples is that Ptolemy clearly does not expect anyone to deny that these examples are true. It is something that everyone knows. Daryn Lehoux describes the belief about garlic and magnets as a common trope of Antiquity. It is not only seen in the *Tetrabiblos* but also in Plutarch's *Quaestiones Convivales*. In both cases, the idea is not brought up as a point of discussion but as an idea that will give support to a larger argument.<sup>70</sup>

Along with the trope of garlic and magnets, Ptolemy uses other commonly-accepted instances of influence and prediction. People admit to knowing the approaching seasons, to understanding the movements of the stars with respect to navigation, to knowing the best times for breeding animals (at the full moon). They take steps to cool or warm themselves based on the coming seasons and are not forced simply to suffer through the extremes. Physicians do their best to predict the course of a disease in order to cure it, or to know what needs to be done to ameliorate their patients' sufferings. If they were to do nothing at all, fate would rule and the patient would die or live as fate decreed, but with the changeable elements, and an understanding of them, the physicians are sometimes able to halt the course of a disease. When physicians are wrong, and sometimes they are, that does not mean that all medicine is false. It is interesting to note Ptolemy's acceptance of fallibility with regard to the practice of astrology, medicine, navigation but in the *Almagest*, there is no mention of errors or mistakes. Certainly, when he lays out the foundations for his astronomical models, he mentions those things he finds to be false, but he does not speak of astronomers who have erred in their practice of astronomy. He does

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<sup>69</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.3.13.

<sup>70</sup>Lehoux, Daryn. 2003, pp. 327-330.

mention that he feels Hipparchus may have erred in a calculation due to his observations, but this is less about pointing out the fallibility of astronomers and more about laying out Ptolemy's own parameters for the year.<sup>71</sup> In his *Geography*, Ptolemy takes time in Book I to present some of the difficulties involved in creating a map of the world, and one of those difficulties is because of the size of the earth and the fallibility of man, as well as the changing nature of the world. He states

For the consensus of the very reports that reached our knowledge because its size has made them inaccessible, while *other [parts] have been described falsely because of the carelessness of the people who undertook the researches*; and some [parts] are themselves different now from what they were before because features ceased to exist or have changed. Hence here [in world cartography], too, it is necessary to follow in general the latest reports that we possess, *while being on guard for what is and is not plausible in both the exposition of current research and the criticism of earlier researches*.<sup>72</sup>

Here Ptolemy is clarifying the errors involved in creating a map, pointing out the high potential for mistakes. He also makes reference to Marinus of Tyre, his predecessor, whose map of the world was good but contained enough errors that a new map was needed. Ptolemy justifies his own new map on the basis that Marinus did not approach reports with enough scrutiny nor did he create a map with a “view either to convenience or to the preservation of proportionality.”<sup>73</sup>

Those sciences which have a physical aspect to them seem to be those most in need of justification which fits with Ptolemy's general view that only mathematics leads to sure knowledge and that studies of the physical world are guesswork.

But, I think, just as with prognostication, even if it be not entirely infallible, at least its possibilities have appeared worthy of the highest regard, so too in the case of defensive practice, even though it does not furnish a remedy for everything, its authority in some instances at least, however few or unimportant, should be welcomed and prized and

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<sup>71</sup>Ptolemy/Toomer. *Almagest*, III.1.

<sup>72</sup>Ptolemy/Berggren and Jones (trans.). *Geography*, I.5, p. 63.

<sup>73</sup>Ptolemy/Berggren and Jones (trans.). *Geography*, I.6, pp. 63-64.

regarded as profitable in no ordinary sense.<sup>74</sup>

For Ptolemy, astrology, as a tool, is no less useful than medicine. It is no less certain than medicine, and within its limitations, it works well and is able to impart beneficial information to the native. In fact, Ptolemy claims that the Egyptians found astrology to be so useful that they united it with the practice of medicine because they saw the potential in being able to predict the future health of a patient and then in taking steps to ameliorate the suffering.<sup>75</sup>

## 2.8 Determinism in the *Tetrabiblos*

The final aspect of Ptolemy's defense of astrology is how he deals with the issue of determinism. In the beginning of his section on the usefulness of astrology, he gives two reasons why it is valuable to study it.

For, in the first place, we should consider that even with events that will necessarily take place, their unexpectedness is very apt to cause excessive pain and delirious joy, while foreknowledge accustoms and calms the soul by experience of distant events as though they were present and prepares it to greet with calm and steadiness whatever comes.<sup>76</sup>

This idea of calming the soul, whether in reaction to good or bad events, is obviously Stoic, similar to his initial claim that knowing the future better connects the soul to the divine. Knowing what will come in the future keeps one from emotional excess. However, the second reason Ptolemy gives for the benefits of astrology is where Manilius' simplistic determinism is left far behind.

A second reason is that we should not believe that separate events attend mankind as the result of the heavenly cause as if they had been originally ordained for each person by some irrevocable divine command and destined to take place by necessity without the

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<sup>74</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.3.15.

<sup>75</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.3.16.

<sup>76</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.3.11.

possibility of any other cause whatever interfering.<sup>77</sup>

Not every cause comes from the heavens, and not every cause means that there is no possibility of fighting against it, and yet, this does not negate astrology's usefulness. Suddenly, Ptolemy's astrology is very different from both his predecessors and from the attackers of astrology.

Manilius claims an immutable fate and Vettius Valens speaks of it in a similar fashion, stating that "Fate has decreed for each person the immutable working out of events, reinforcing this decree with many opportunities for good or bad consequences."<sup>78</sup> Likewise, those who attacked astrology, e.g. Cicero and Sextus Empiricus, had a similar black-and-white view of astrology. Throughout his attack in *De divinatione*, Cicero gives no other option other than that the stars cause everything or they cause nothing.<sup>79</sup> Sextus Empiricus, in his *Adversos Mathematicos*, explicitly states that the stars have to cause everything or nothing. He says that "since some events occur by necessity, some by chance, and some by our action, if the Chaldeans aim at a possible prophecy, they will certainly make their forecasts about events which result either from necessity or from chance or from our action" and if they are based on chance, they cannot be predicted.<sup>80</sup> Stars are a cause, it is true. Ptolemy said so himself in I.2.8 that the heavens are the primary cause, but one's fate is not immutable. There is no *fata regunt orbem* in Ptolemy's astrology, or rather there does not have to be. While the movements of the heavens are destined and unchangeable,<sup>81</sup> those of the earth are not. In fact, Ptolemy calls earthly fate, "natural and

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<sup>77</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.3.11.

<sup>78</sup>Vettius Valens/Riley (trans.). *Anthologiae*, V.6, p. 102.

<sup>79</sup>Cicero/Falconer (trans.). *De divinatione*, II.89-99.

<sup>80</sup>Sextus Empiricus/Bury (trans.). *Adversos Mathematicos*, V.46-48.

<sup>81</sup>καθ' εἰμαρμένην θεῖαν καὶ ἀμετάπτωτον.

mutable.”<sup>82</sup> Although “drawing its first causes from above it is governed by accident and by consequence.”<sup>83</sup> Thus, Ptolemy is neatly attempting to preserve the possibility of changing one’s future while still giving astrology validity. This is not to say that the stars do not exert a powerful influence on the earth. They do, and, without intervention, their powers will reign supreme, but in particular instances, that is *only* without intervention. “For even of stones, plants, and animals, and also of wounds, mishaps, and sicknesses, some are of such a nature as to act of necessity, others *only if no opposing thing interferes*.”<sup>84</sup> The mutability of the world affects the divine influence which comes down from the stars which makes changes possible. That is why, when change *is* possible, “we must give heed to the astrologer, when, for example, he says that to such and such a temperament, with such and such a character of the ambient, if the fundamental proportions increase or decrease, such and such an affection will result.”<sup>85</sup> In addition to allowing for chance, Ptolemy also subsumes the particular to the general, i.e. the horoscope of an individual to the general predictions given for an entire nation. Not only are the lives of the natives subject to chance and the changeable natures of the sublunar world, they are also subject to the larger-scale effects.

We believe it fitting to treat first of the general division [as opposed to the individual or genethliological], because such matters are naturally swayed by greater and more powerful causes than are particular events. And since weaker natures always yield to the stronger, and the particular always falls under the general, it would by all means be necessary for those who purpose an inquiry about a single individual long before to have

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<sup>82</sup>καθ’ εἰμαρμένην φυσικὴν καὶ μεταπτώτην.

<sup>83</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.3.11. Robbins translates κατὰ συμβεβηκὸς καὶ κατ’ ἐπακολούθησιν as “by chance and natural sequence.” The sense is that there is an element of uncertainty in the causes of the natural world because the natural world changes where the celestial world is constant and unchanging. Ptolemy clarifies this as he continues his argument.

<sup>84</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.3.12.

<sup>85</sup>Ptolemy. *Tetrabiblos*, I.3.13.

comprehended the more general considerations.<sup>86</sup>

By demonstrating a less-than-absolute position for astral influence on the sublunar world, Ptolemy has effectively answered many of the common attacks on astrology, including Cicero's claims about irrevocable fate, other influences and even Cicero's ideas about the correction of defects, e.g. the famous story that Demosthenes was able to train himself out of the defect that prevented him from pronouncing the letter *rho*.<sup>87</sup> Ptolemy has not dismissed the idea of the stars causing the effects, but his caveats allow for a high degree of free will. A person does not have to see their predicted future and accept that nothing can be done. Rather, one can look at the prediction and figure out which of the various effects is the strongest. "For if these distinctions are thus made, it is clear that both in general and in particular whatever events depend upon a first cause, which is irresistible and more powerful than anything that opposes it, must by all means take place."<sup>88</sup> The stars are a cause, and in some cases, *the* cause determining the fate of a person or region of the earth, but because the terrestrial realm is changeable, and because the elements themselves are not permanent, the determinism cannot be absolute and one's fate is not absolutely determined unless one does nothing about it or in those instances in which the stars' influence overrides the elemental influence.

## 2.9 Conclusion

In Ptolemy's *Tetrabiblos* his method of defending astrology presented a major change in how it was practiced. By grounding astrology in a rational approach, as opposed to the mystical explanations employed by Vettius Valens, he gave it a scientific foundation. He did not attempt

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<sup>86</sup>Ptolemy. *Tetrabiblos*, II.1.54.

<sup>87</sup>Long. 1982, p. 183.

<sup>88</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, 1.3.12.

to deny its shortcomings but justified them in a way that would give later scholars a firm basis from which to begin their own arguments about the validity and value of astrology. As will be seen in the following chapters, Ptolemy's influence was felt for centuries after the publication of the *Tetrabiblos*, perhaps not to the same degree as the *Almagest*, but Ptolemy's astrology breathed new life into an art that was often on the periphery of the accepted sciences.

### Chapter 3 Transmission to the Islamic World

Following the publication of Ptolemy's *Tetrabiblos* in the second century A.D., there were a number of other astrologers and compilers, many of them in the eastern parts of the empire. From Vettius Valens, Ptolemy's younger contemporary, in Antioch to numerous astrologers located in Egypt, e.g. Paulus Alexandrinus (ca. 4<sup>th</sup> cent. A.D.), Hephaestio of Thebes (ca. 5<sup>th</sup> cent. A.D.), and Rhetorius (ca. 7<sup>th</sup> cent. A.D.), astrology continued to be an important subject of study, but its practice in Latin Europe began to fade. Even those mentioned, particularly Hephaestio of Thebes, based his works on Ptolemy's astrology, and Rhetorius was more of a compiler than an original astrologer.<sup>1</sup> Following the decline of the western empire, the technical works, mostly written in Greek, fell into disuse in the West as the number of people who could read ancient Greek decreased. This is not to say that there were no Latin astrological works. Firmicus Maternus' *Mathesis*, a compilation of astrological practices, was written in the fourth century and remained available in Latin Europe, although there are few citations of it until the eleventh century. However, the Greek authorities were all but lost in early medieval Europe and the technical pursuit of astrology declined in the Latin West.<sup>2</sup> In contrast, the Greek East, centered in Byzantine empire, particularly its capital in Constantinople, did continue the tradition of technical astrology, both in writing new works and in compilations of older works.<sup>3</sup> The Byzantine Empire maintained a Greek culture, language and traditions which led to the survival

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<sup>1</sup>The identification of Rhetorius and his work has been difficult, but see Pingree's 1977 article "Antiochus and Rhetorius," pp. 220-223, for his initial placement of Rhetorius in the early seventh century. See also Pingree's 2001 article, "From Alexandria to Baghdad to Byzantium," in which he dates Rhetorius' work to 620 and demonstrates its widespread use in Byzantium and Baghdad.

<sup>2</sup>For the Latin astrological tradition see chapter 5.

<sup>3</sup>Tester. 1987, p. 94.



of the Greek learning which was lost in the Latin West. Prominent figures in the history of astronomy and astrology such as Stephanus of Alexandria aided in this preservation.<sup>4</sup> The actual identity of Stephanus, as well as which works are genuinely his, has been a matter of some confusion, but according to Wanda Wolska-Conus, Stephanus of Alexandria and another scholar called Stephanus of Athens are actually the same person.<sup>5</sup> Tradition states that after the conquest of Alexandria, he fled to Constantinople, taking with him the curriculum he taught, which likely included astrology, and once in the city, he resumed his role as a teacher.<sup>6</sup> Among the numerous works attributed to Stephanus, he is well known for a commentary on Ptolemy's *Handy Tables*. The survival of technical works written in Greek is an important part of the process of transmission to the Islamic world, and the works of Ptolemy, as well as other Greco-Roman scholars, survived in the Byzantine Empire while almost all but the memory was lost in the Latin West.

The paths by which astrology reached the Islamic world are many and varied, coming both from east and west, although the ultimate roots still lie in the astrology practiced in the Greco-Roman world. On the eastern side, genethliological and catarchic astrology were studied in India during the first millennium B.C., possibly through Mesopotamian astronomy which survived in the Achaemenid empire, following the death of Alexander the Great.<sup>7</sup> In the first millennium A.D., Indian scholars began to incorporate aspects of Hellenistic astronomy, along

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<sup>4</sup>Pingree. 2001, p. 12. For more on Stephanus, see the forthcoming article, "Stephanus the Alexandrian Philosopher, the Kanon and a Seventh-Century Millennium," by Mossman Rouéche, in the *Journal of the Warburg Institute*.

<sup>5</sup>Wolska-Conus. 1989, pp. 5-89.

<sup>6</sup>Magdalino. 2002, p. 35.

<sup>7</sup>Plofker. 2009, p. viii.

with spherical geometry, into their own works, due to “interest in the astrological doctrines learned from Greeks settling in western India.”<sup>8</sup> These Indian Greeks were a powerful influence in the early centuries and their numbers only increased with continuing trade between the Greek settlements and the Indians. This led to works written by these Indian Greeks, or Yavanas. One such text is a redaction of a second-century Greek astrological text of which we have a third-century poetic translation written by Sphujidhvaja, called the *Yavana-jātaka*. The methods propounded within this text have obvious Greek (and Babylonian) overtones.<sup>9</sup> Greek influence on Indian astronomy and astrology had been attested at least since the Seleucid period, and as trade routes between the Roman empire and India arose, the interactions between the civilizations continued.<sup>10</sup> Nor were the Indian astrologers the only scholars to use Greek texts in their practice. The Sasanians in Iran appear to have relied predominantly on astrological works from other civilizations. Indian and Greek science flourished within Iran under the reign of Shāpūr I in the third century A.D. In fact, the surviving text of Dorotheus of Sidon is fully extant only in an Arabic translation of a Pahlavī text which was first translated and revised in the A.D. third and fourth century and seems to be the source of at least two books in Māshā’allāh’s work on astrology.<sup>11</sup> This seems to be similar to the route taken by the *Anthologiae* of Vettius Valens, although only fragments of the Pahlavī text have survived, but unlike Dorotheus’ text, Vettius Valens’ *Anthologiae* has survived in Greek.<sup>12</sup> Transmission from Sasanian Persia to the Islamic

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<sup>8</sup>Plofker. 2009, p. viii.

<sup>9</sup>Plofker. 2009, pp. 48-49. See also, Pingree. 2001, p. 4. See also Pingree. 1978.

<sup>10</sup>Pingree. 1963, pp. 234-237.

<sup>11</sup>Pingree. 1989, pp. 230-231.

<sup>12</sup>Pingree. 1963, p. 241.

world largely came about due to the Islamic conquests, the swift spread of Islam from a local religion on the Arabian Peninsula to an empire which stretched from al-Andalus to the Indus River. The unifying factor of religion and political rule during the early centuries brought the knowledge of Persian scholars into the new empire ruled by the late Umayyad dynasty and, later, in the Abbasid dynasty. One consequence of this new rule was the translation of texts from Pahlavī into the language of the empire, i.e. Arabic. The texts translated were not exclusively astrological in nature, but even before the establishment of the House of Wisdom in Baghdad under the Abbasids, scientific treatises were being translated into Arabic.<sup>13</sup>

This evidence of transmission is not one of simple translation and reproduction. The Indian astrologers took the catarchic astrology they received and modified it into what is now known as interrogational astrology, the idea that the results of an action can be determined by the use of a horoscopic diagram of the moment the question was asked. Unlike catarchic astrology, it is not intended to find the most propitious moment to begin an action. Rather it is used to see what the consequences will be.<sup>14</sup> The Sasanians, for all that Pingree generally dismisses any attribution of originality to their works, do seem to be the originators of historical astrology, in particular, the use of Saturn-Jupiter conjunctions to explain historical events, and possibly to predict future events as well. This use of planetary movements is not found in Greek astrology, but the idea shows up frequently in subsequent works by scholars throughout the Latin West and the Middle East.<sup>15</sup>

Transmission of astrology coming from the West also came through many routes. Most of

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<sup>13</sup>Gutas. 1998, pp. 25-27.

<sup>14</sup>Pingree. 2001, p. 5.

<sup>15</sup>Pingree. 1963, p. 245. Examples include such scholars as Māshā'allāh, Abū Ma'shar, Abraham Ibn Ezra, Pierre d'Ailly, and Girolamo Cardano.

the major work of transmission of knowledge from the Greco-Roman world to the Islamic world took place during the great translation movements of early Abbasid rule, although it did not begin in the Islamic world. As the western half of the Roman empire declined, the eastern portion flourished. The Greek texts which were lost in Rome were studied, copied, passed on in Constantinople. The survival of these texts was important to the later translation movement because, as Gutas points out, all the will in the world to translate means little if no texts are available. Consequently, during the ninth century, Arab scholars were traveling the continent looking for texts and at this time, copying of secular Greek texts resumed in Constantinople and it seems possible that these texts were commissioned by Arab scholars for translation into Arabic.<sup>16</sup>

Constantinople was not the only source for the transmission of astrology from the west. Throughout the Near and Middle East, translations from Greek into Syriac took place, although Gutas argues that these translations were mostly undertaken under the auspices of the Abbasid rulers in tandem with the translations from Greek directly into Arabic.<sup>17</sup> In addition, a center of Greek learning arose in Ḥarrān, a city just south of Edessa in modern-day Turkey, following the closing of the Athenian school and expulsion of the pagans from the Roman Empire during the reign of Justinian. It is here that Tardieu and Hadot proposed that Simplicius and other pagan scholars settled after leaving Athens, within the boundaries of the Byzantine empire but not forced to convert to Christianity, and it is possible that Simplicius composed his famous commentaries on the works of Aristotle here as well.<sup>18</sup> Astrology flourished in Ḥarrān in large

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<sup>16</sup>Gutas. 1998, pp. 175-186.

<sup>17</sup>Gutas. 1998, pp. 21-22.

<sup>18</sup>Pingree. 2002, pp. 9-10. See also Hadot. 1987, pp. 3-39. This theory of the establishment of a Neoplatonic school in Ḥarrān has been rejected by Kevin van Bladel. His

part because of the Sabian scholars who, upon receipt of Ptolemy's *Handy Tables* as well as his important astronomical works the *Almagest* and the *Planetary Hypotheses*, incorporated theoretical astronomy into their star worship.<sup>19</sup> Pingree describes the religion of the Sabians as syncretic enough to be tolerated by the Muslims following the Arab invasion, a situation more than likely brought about by the extremely heterogenous population of people who lived there. The various groups living in Ḥarrān included the Sabians, the Christians, the pagans like Simplicius, the Manichaeans, and the Muslims.<sup>20</sup> The culture which flourished in Ḥarrān created a safe haven of sorts for the Greek texts which otherwise may have been lost. As happened in the east, when the Arab conquerors swept through, the texts which had survived fell into the hands of the Arab scholars.

### 3.1 Transmission of Ptolemy's *Tetrabiblos*

Ptolemy and his works enjoyed a high reputation in the Islamic world. A number of his works were translated into Arabic during the intense translation period of the eighth and ninth centuries, including the *Tetrabiblos*, *Almagest*, *Geography*, *Optics*, *Planetary Hypotheses*. Beyond that, other astrological works were also mistakenly ascribed to him. One of the more famous examples is that of the *Centiloquium* (entitled *Karpos* in Greek), a collection of 100 aphorisms supposedly written by Ptolemy based on the *Tetrabiblos*.<sup>21</sup> This text was not only

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critique of Tardieu's hypothesis is based on what he describes as a misunderstanding of al-Mas'ūdī's description of the city in his *Murūj al-dhahab*. Van Bladel isn't claiming a total lack of interest in Plato at Ḥarrān, nor that there was access to Greek texts, but he questions that there was a school devoted to Plato's works in the city. See van Bladel. 2009, pp. 70-79.

<sup>19</sup>Pingree. 2002, pp. 13-14.

<sup>20</sup>Pingree. 2002, pp. 17-19.

<sup>21</sup>Richard Lemay has argued that, in spite of the existence of a Greek text of the *Centiloquium*, it is, in fact, a creation of an Arabic scholar, Aḥmad ibn Yūsuf, in Cairo in the ninth or tenth century. See Lemay. 1978, pp. 91-107. Fuat Sezgin, although using the Greek text

popular in the Islamic world, but it also enjoyed a good reputation in Europe, still with Ptolemy listed as the author. Ibn al-Nadīm, author of the tenth-century *Fihrist*, also mistakenly lists a text on genethliological astrology entitled *Kitāb al-Mawālīd* as one of Ptolemy's works.<sup>22</sup>

Following its publication in the second century, the *Tetrabiblos* was fairly popular in the Greco-Roman world.<sup>23</sup> Porphyry wrote a commentary to the text in the late-third century, most of the fragments of which are preserved in Hephaestio's *Apotelesmatika* from the fifth century,<sup>24</sup> and Pancharius wrote a commentary around the same time although only fragments of it have survived. Hephaestio of Thebes compiled his *Apotelesmatika* based on the works of Dorotheus of Sidon and Ptolemy.<sup>25</sup> Three of the later commentaries, attributed to Proclus, Porphyry and Demophilus, were compiled and translated into Latin by Hieronymus Wolf at Basel in 1559.<sup>26</sup> Wolf's text is a facing-page translation with minor marginal comments throughout and preserves these anonymous commentaries from late Antiquity. Ibn al-Nadīm credits Eutocius of Ascalon, a sixth-century scholar, with writing a commentary on the first book of the *Tetrabiblos*. If this is true, the commentary has not survived, although Eutocius does present Ptolemy's Terms as an

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as evidence for a Greek origin, points out that there are many elements of the *Centiloquium* which are not part of the *Tetrabiblos*, such as catarchic astrology. See Sezgin. 1979, pp. 44-45. If Ahmad ibn Yūsuf is not the author, at the least the attribution to Ptolemy is incorrect.

<sup>22</sup>Sezgin. 1979, p. 43.

<sup>23</sup>For a list of Greco-Roman astrologers, see Pingree. 1978, pp. 421-445.

<sup>24</sup>Pingree. 1978, p. 438.

<sup>25</sup>Pingree. 1978, p. 429. See also Hephaestion of Thebes/Pingree (ed.). 1973-1974. *Apotelesmatika*.

<sup>26</sup>Robbins. 1940, xvi. Newman and Grafton (2001) discuss Wolf's translation in the introduction to *Secrets of nature: astrology and alchemy in early modern Europe*. See pp. 9-11. Wolf's translation has not been republished since the sixteenth century, but the Bavarian State Library owns and has digitized one of the surviving texts under the title of *In Claudii Ptolemaei quadripartitum Enarrator ignoti hominis, quem tamen Proclum fuisse quidem existimant*.

example in his work, *Astrologoumena*.<sup>27</sup> In addition, there is the *Proclus Paraphrase*, of uncertain attribution, and an anonymous commentary from late Antiquity. Many of these texts, along with the text of the *Tetrabiblos* were appropriated by Muslim scholars in the early Islamic era.

### 3.2 Astrology in Early Islam

It was during the rule of al-Manṣūr (754-775) and his son al-Mahdī (775-785) in the eighth century that the beginning of an organized translation movement occurred, although the greatest output occurred in the ninth century.<sup>28</sup> Central to this translation of texts was al-Manṣūr's interest in the uses of astrology. The founding of Baghdad on 30 July 762 was done on the advice of his court astrologer, Nawbakht, along with three other astrologers, including Māshā'allāh, a Persian-Jewish astrologer. According to al-Mas'ūdī, a tenth-century historian, al-Manṣūr was "the first caliph to favor astrologers and to act on the basis of astrological prognostications. He had in his retinue the astrologer Nawbakht the Zoroastrian, who converted to Islam upon his instigation..." In addition, al-Manṣūr was "the first caliph to have books translated from foreign languages into Arabic" including such works as Ptolemy's *Almagest*, a work on geometry by Euclid and "other ancient books from classical Greek, Byzantine Greek, Pahlavī, Neopersian, and Syriac."<sup>29</sup> Gutas explains the rise of astrology within the Abbasid court as being due to the influence of Sasanian culture. The triumph of the Abbasid dynasty over the Umayyads relied

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<sup>27</sup>Heilen. 2010, p. 62. For a reference to Eutocius' commentary see also Sezgin. 1979, p. 43.

<sup>28</sup>Dallal. 1999, pp. 159-161.

<sup>29</sup>Al-Mas'ūdī/Pellat (ed.), *Murūj al-dhahab*, vol. 5, p. 211, paragraph 3446. Translated in Gutas. 1998, p. 30. The translation by Paul Lunde and Caroline Stone reads slightly differently: "He was the first of the Caliphs to bring astrologers to his court and make his decisions in accordance with the stars." See Lunde and Stone (trans. and ed.). 1989, p. 388.

heavily upon support from the Persians, some of whom converted to Islam and others who remained Zoroastrians.<sup>30</sup> The Sasanians have already been shown to be interested in Greek astrological works<sup>31</sup> and, although they became a part of the Islamic empire, the stronger parts of their culture survived and heavily influenced the Abbasid rulers.

Some of the leading astrologers of the early Abbasid period came from Persia, e.g. Māshā'allāh and Abū Ma'shar, and some, like Nawbakht, were Zoroastrians. This tie to the earlier Sasanian empire also allowed for a reliance upon historical astrology, i.e. the use of the stars to predict the course of nations, a concept the Abbasid rulers wished to exploit for their own benefit, portraying themselves as the gatherers of knowledge from all civilizations, not just Arabic.<sup>32</sup> Gutas describes al-Manṣūr's appropriation of astrology as part of his strategy to consolidate Abbasid power after the revolution, to remove some of the causes for opposition from some of the Persian nobility. He established Marw as a center for translation of Pahlavī texts, many of which were specifically astrological in nature.<sup>33</sup> Nawbakht presented this program of translating foreign texts as the next step in a long history of gathering knowledge, a history which had begun with the first Hermes who lived in Babylon but then traveled to Egypt and became a ruler there. Another major gathering of knowledge took place in Alexandria at the great library where ancient texts were translated into Greek. The Sasanians followed through their gathering of scientific treatises and translating them into Pahlavī. For Nawbakht, the Abbasids were simply yet another step in this gathering and preservation of the knowledge of the ancients.

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<sup>30</sup>Gutas. 1998, p. 34.

<sup>31</sup>See chapter 2. See also Pingree. 1989 and 1963.

<sup>32</sup>Gutas. 1998, p. 46.

<sup>33</sup>Gutas. 1998, p. 50, 109-110.



Ibn al-Nadīm, in his tenth-century work the *Fihrist*, quotes Nawbakht as saying that “for the people of every time and age there is new experience and a renewal of scholarship as foreordained by the stars of the zodiac, which is the master of time’s destiny as commanded by Allah, exalted be His majesty.”<sup>34</sup> By presenting the Abbasid rulers as doing a work which was both “foreordained by the stars” *and* an expression of the will of God, Nawbakht illustrates the interweaving of Sasanian and Islamic culture which al-Manṣūr embraced as a necessity for solidifying his position as ruler of a far-flung empire.

From the beginning of the translation movement, astrological texts formed a significant part of those efforts. In addition to Arabic translations of the Pahlavī versions of the works of Dorotheus of Sidon and Vettius Valens, by the ninth century Ptolemy’s *Tetrabiblos* had also been translated and became an important source for astrologers in the Islamic empire as one of the earliest texts translated, which contributed to its status in forming the foundations of Islamic astrology. Islamic scholars were aware of the various issues and principles of technical astrology as early as the eighth century and the list of translations shows that Ptolemy’s treatise was a part of that knowledge since the eighth century.<sup>35</sup> An awareness of Ptolemy’s importance can be seen in *Kitāb al-Nahmuṭān*, written by Abū Sahl ibn Nawbakht, the son of al-Manṣūr’s court astrologer. In the astrological history Abū Sahl gives, he speaks of the passage of learning to Persia via the gathering and translating of texts. Among those texts he includes “Hermes the Babylonian who ruled over Egypt, Dorotheus the Syrian [of Sidon], Qaydarūs the Greek from the city of Athens which is famed for its science, Ptolemy the Alexandrian, and Farmāsb the

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<sup>34</sup>Ibn al-Nadīm/Dodge (trans.). 1971. *Fihrist*, p. 575.

<sup>35</sup>Sezgin. 1979, pp. 11-12.

Indian.”<sup>36</sup> The first translation of the *Tetrabiblos* was made by al-Bīṭrīq Abū Yahyā during the caliphate of al-Manṣūr (754-775) at the behest of ‘Umar ibn al-Farrukhān al-Ṭabarī, who had translated the astrological poem of Dorotheus of Sidon from Pahlavī, because he himself did not know Greek.<sup>37</sup> A commentary on the *Tetrabiblos* was written by ‘Umar ibn al-Farrukhān in the second half of the eighth century. It was followed by the translation of Ibrāhīm ibn al-Ṣalt in the ninth century. That translation was then corrected by the famous translator Ḥunayn ibn Ishāq.<sup>38</sup> In addition to the direct translations, Sezgin lists six different Arabic commentaries written from ‘Umar ibn al-Farrukhān’s in the eighth century to that of Abū al-Ḥasan ‘Alī ibn Riḍwān in the eleventh century.<sup>39</sup> Ullmann includes Abū Ma’shar in his list of commentators. While the original title of the Greek text is a matter for discussion, the title used in Arabic is fairly consistent. Sezgin lists *Kitāb al-Arba’a* (The Book of the Four), *al-Arba’ al-maqālāt* (The Four Treatises), *al-Maqālāt al-arba’* (The Four Treatises), and *Kitāb al-Qaḍā’ ‘alā al-ḥawādith* (The Book of the Decree on the Deeds). Only the last, found in the manuscript Dublin, Ch. Beatty 4566, varies from the reference to the structure of the text.<sup>40</sup> In addition, at least four scholars had commented on the text by the tenth century when Ibn al-Nadīm wrote his work.<sup>41</sup>

Ibn al-Nadīm’s *Fihrist* also demonstrates the popularity of astrology, at least among

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<sup>36</sup>Abū Sahl/Gutas (trans.). *Kitāb al-Nahmuṭān*. Taken from the *Fihrist* of Ibn al-Nadīm, 238.9-239.23. As quoted in Gutas. 1998, pp. 39-40.

<sup>37</sup>Gutas. 1998, p. 109.

<sup>38</sup>Sezgin. 1979, p. 42. See also Ibn al-Nadīm/Dodge (trans.). *Fihrist*, p. 640.

<sup>39</sup>Sezgin. 1979, pp. 43-44.

<sup>40</sup>Sezgin. 1979, p. 43. Sezgin lists one other manuscript with a similar title, Cairo Dār, mīqāt 123: *fī al-Qaḍā’ ‘alā dalāl il al-nujūm*.

<sup>41</sup>Ibn al-Nadīm/Dodge (trans.). *Fihrist*, p. 640.

educated scholars in Baghdad, particularly in the House of Wisdom. Section two of chapter seven, which is devoted to the astronomers and mathematicians, contains references to numerous books written on astrological subjects. From al-Kindī, the “Philosopher of the Arabs,” and his books on such topics as “Offering Knowledge about Questions by Indication of the Heavenly Bodies” or “Determining the Usefulness of Astrology”<sup>42</sup> to the famous works of Māshā’allāh and Abū Ma’shar, to less well-known astrologers such as Sahl ibn Bishr who is listed with a single astrological work to his name, it is clear that astrology had an important place within this part of the Islamic world.

That place, however, was not secure. Astrology was often threatened by attacks both from theological and philosophical scholars. Saliba lists names of authors of polemics against astrology which range from an eighth-century grammarian, al-Khalīl ibn Aḥmad, to famous philosophers such as Ibn Rushd and Ibn Sīnā in the eleventh and twelfth centuries to Ibn al-Qayyim, a fourteenth-century theologian. These attacks were not confined to any one group, nor to a specific century.<sup>43</sup> The theologians attacked it based on its incompatibility with the tenets of Islam, but the philosophers also dismissed it based on the same types of arguments which had been standard in Late Antiquity.

One example is the *Book on the Stars* by ‘Abd al-Malik ibn Ḥabīb, who flourished in the ninth century in al-Andalus. In writing of the stars, particularly the lunar mansions,<sup>44</sup> Ibn Ḥabīb introduces the *Book on the Stars* with a fairly lengthy discourse on the legal uses of the stars.

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<sup>42</sup>Ibn al-Nadīm/Dodge (trans.). *Fihrist*, p. 621.

<sup>43</sup>Saliba. 2004, pp. 342-343.

<sup>44</sup>Lunar mansions or *al-anwā* are a sort of lunar zodiac used for timekeeping and also for weather prediction which were commonly used in the pre-Islamic Near East and can be traced back to antecedents in both India (called *nakṣatras*) and China. For more information on the lunar mansions and their use see, e.g., Varisco. 2000, pp. 621-627.

Bolstering his case with quotations from the Qur'ān as well as *ḥadīths*,<sup>45</sup> he specifically differentiates between using the stars as guides for navigation and using them for predicting the life of a native.

...in the darknesses of the night and the darknesses of the sea you know by them the direction you want, west or east or south or north. There is no [power of] guidance in them for anything else of what the astrologers say, such as need or happiness or death or life or wealth or poverty or well-being.<sup>46</sup>

Thus, it is good to learn of the stars enough to be guided during nocturnal travels, but anything beyond that risks the errors of astrology. Nor is Ibn Ḥabīb the only scholar to use *ḥadīths* as proof of the dangers of astrology. Abū al-Ḥasan al-Bardhāʿī, an early member of the Muʿtazila, quoted this *ḥadīth* as a warning: “If someone mentions the stars, stay away from him.”<sup>47</sup> His interpretation of these words of Muḥammad is that only the misguided philosophers would believe that the stars could be responsible for the course of events.<sup>48</sup> It is wrong to predict the future using the movements of the heavens because that is the province of God. Ibn Ḥabīb quotes the Qur'ān which reads, “God knows the hour. He sends down the rain and he knows what is in the wombs, but no [human] soul knows what it will gain the next day and nobody knows in which land he will die.” [Q 31:34] Since only God can know the future, astrologers who claim to predict what will come are committing heresy, as are those who believe the astrologers, and

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<sup>45</sup>A *ḥadīth* is a recorded saying or tradition attributed to the Prophet Muḥammad. Many early Islamic scholars used the *ḥadīths* to interpret the Qur'ān. They were gathered into collections during the eighth and ninth centuries. Three standard collections of *ḥadīths* are al-Bukhārī/Khān, Muḥammad Muḥsin (trans.). 1979. *Ṣaḥīḥ al-Bukhārī*. Abū Dāʿud/Sharīf, Muḥammad Maḥdī (trans.). 2008. *Sunan Abu Dawud: the third correct tradition of the Prophetic Sunna*. Muslim ibn Ḥajjāj al-Qushayrī/al-Khattab, Nasiruddin (trans.). 2007. *Ṣaḥīḥ Muslim: English translation of Ṣaḥīḥ Muslim*.

<sup>46</sup>Ibn Ḥabīb/Kunitzsch (trans.). 1994. *Book on the Stars*, p. 182.

<sup>47</sup>Goldziher (trans.). 1981, p. 196.

<sup>48</sup>Goldziher. 1981, p. 196.

“whoever commits heresy is called on to repent, and if he does not he is put to death.”<sup>49</sup>

This introduction even includes a brief foray into the common arguments against astrology such as the problem of both physical and astrological twins, although those methods of dismissing astrology are not the focus. For Ibn Ḥabīb, it is the religious arena that necessitates the dismissal of astrology as a valid course of study, not the philosophical or technical arguments. Astrology is one of the *‘ulūm al-awā’il* or “the sciences of the ancients.”<sup>50</sup> While divination had a long history within early Islam, astrology as found in Ptolemy’s *Tetrabiblos* was a part of what Saliba describes as a “coherent but foreign body of Greek philosophy.”<sup>51</sup> The popularity of these sciences in intellectual circles did not extend to the religious sphere. Ibn Ḥabīb’s critique is only one of the early polemics, the earliest surviving attack being the poem written by al-Khalīl ibn Aḥmad.<sup>52</sup> Goldziher illustrates the uneasy status of these sciences among the religious leaders with descriptions of them as *‘ulūm mahjūra*, “repudiated sciences,” and *ḥikma mashūba bi-kufr*, “wisdom mixed with unbelief.”<sup>53</sup> The religious opposition to astrology had a general effect on the other received sciences. Astrology, as one of these *‘ulūm al-awā’il*, endangered the practice of other foreign sciences. In order to avoid this condemnation by association, philosophers themselves rejected astrology as something unrelated to them. The theological attacks on foreign sciences could otherwise use the “Achilles heel” of astrology as a way of attacking all foreign

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<sup>49</sup>Ibn Ḥabīb/Kunitzsch (trans.). *Book on the Stars*, pp. 184-185.

<sup>50</sup>Goldziher. 1981, p. 185.

<sup>51</sup>Saliba. 1994, pp. 67-68.

<sup>52</sup>Saliba. 1994, p. 68.

<sup>53</sup>Goldziher. 1981, p. 187.

knowledge.<sup>54</sup> The official religious rejection of astrology had another side effect on the relationship of astrology with the other foreign sciences: in spite of the continuing use of the same terminology for both, astrology and astronomy became separated as sciences in Islam. A common argument from religious leaders was that while astronomy was a permissible science, astrology was to be avoided.<sup>55</sup>

This separation of astronomy from astrology came fairly early in the Islamic world. Astronomers were hard-pressed either to justify the study of a subject so closely connected to that of astrology or to divorce themselves from it completely. The difficulty lay in the fact that the Greek sources, from which much of astronomy came, conflated the two disciplines as being aspects of each other.<sup>56</sup> Ptolemy's definition of the two sciences in the *Tetrabiblos* relates them as the "means of prediction through astronomy,"<sup>57</sup> an idea which is also found in Arabic texts. Saliba argues that the reason for the division stems from the aforementioned attacks on astrology. While the discipline of astronomy was not fully distinct from astrology in classifications of science until the thirteenth century,<sup>58</sup> the beginnings of the separation can be seen, according to Saliba, with the reign of the Umayyad caliph 'Abd al-Malik ibn Marwān (685-705) and the "Arabization of the administration," i.e. the reforms which made the language of the Qur'ān also the language of politics.<sup>59</sup> Quranic scholars could reject all recently-imported sciences on the

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<sup>54</sup>Saliba. 1992, p. 347.

<sup>55</sup>Saliba. 1994, p. 70.

<sup>56</sup>Saliba. 2002, p. 27.

<sup>57</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.1.

<sup>58</sup>Saliba. 1994, p. 66.

<sup>59</sup>Saliba. 2002, p. 26.

basis of their foreign origins. It was Ibn Sīnā in the eleventh century who first explicitly separated astronomy from astrology in his *Classification of the Rational Sciences*,<sup>60</sup> but Janos claims that al-Fārābī, in the ninth century, actually anticipated Ibn Sīnā's separation by dividing *ilm al-nujūm* into judicial astrology and mathematical astronomy, similar to Ptolemy's division of astronomy and astrology as the "two forms of prognostication through astronomy."<sup>61</sup> By the time Abū Ma'shar published his thorough defense of astrology, the separation between those who practiced astrology, *ilm ahkām al-nujūm*, and those who practiced astronomy, *ilm al-hay'a*, was growing wide enough that they were beginning to follow separate paths, in effect creating a new science, called *ilm al-hay'a*,<sup>62</sup> in which the intent was not to explain the interaction of the sublunar world with the celestial realm. Rather, the goal was to accurately describe the structure and movements of the planets. This allowed astronomy to be described as a mathematical science while astrology was associated with the less acceptable natural philosophy.<sup>63</sup> By the late tenth century, Ibn al-Nadīm used the term *hay'a* to describe the works of a commentator on the *Almagest*, explaining that they had more to do with that discipline than with *ilm al-nujūm*.<sup>64</sup> By divesting astronomy of its astrological links, astronomy "could flourish among the religious elite who saw in it a complementary discipline to their own."<sup>65</sup> This also freed astronomers from the

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<sup>60</sup>Ragep. 1993, pp. 34-35.

<sup>61</sup>Janos. 2012, pp. 45-46. This is in opposition to the Ikhwān al-Ṣafā' who continued to describe astronomy and astrology as aspects of the same science.

<sup>62</sup>*Ilm al-hay'a* literally means the "science of the configuration," *al-hay'a* meaning shape or form.

<sup>63</sup>Ragep. 2001, pp. 51-53.

<sup>64</sup>Saliba. 1994, p. 66.

<sup>65</sup>Saliba. 2007, p. 176.

criticisms being leveled at astrology, meaning that they, too, could attack astrology as being something other than themselves.

This trend toward polemics against astrology should not, however, necessarily be considered the public view on astrology. In practice, as Saliba has demonstrated, astrology enjoyed an important, if ambivalent, place in society. Astrologers were found not only in the court of the Abbasid caliphs but also under the patronage of other wealthy individuals as well as performing their art out on the public thoroughfares. The fees practicing astrologers received ranged from Abū Ma'shar's 130 dinars per month as the chief astrologer of al-Mu'tazz (866-869), comparable to the salary of a professor or a judge, down to the 2 dirhams per horoscope cast earned by street astrologers, or about the price of a fish.<sup>66</sup> These details demonstrate a thriving practice which was tolerated by the religious and political leaders, if not accepted outright.

### 3.3 Conclusion

This path of transmission was one of two major branches of the transmission of astrology from Antiquity.<sup>67</sup> During the translation period in the eighth and ninth centuries in the Islamic world, astrological texts were some of the first translated into Arabic. Generally, these texts were the more technical treatises, although some of the commentaries and compilations from Late Antiquity were among the translated texts. In spite of the often-uncertain position of astrology within Islam, it remained a popular subject of study. However, conflicts with the philosophers, astronomers, and religious scholars also created the necessity of justifying and defending the practice of astrology. Ptolemy's *Tetrabiblos* made a straightforward trek from the Greco-Roman world to the Islamic world, twice being translated directly from Greek into Arabic. This work

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<sup>66</sup>Saliba. 1992, pp. 357-360.

<sup>67</sup>See chapter five for the Latin tradition.



contained the foundations of astrology, both philosophical and technical, and many of the later Arabic treatises were based on the concepts contained within the *Tetrabiblos*. In addition, the *Tetrabiblos* provided an example of how to defend astrology against religious and philosophical polemics. Although it was far from the only astrological text to make the transition to the Islamic world, elements of Ptolemy's method of defending astrology can be seen in Arabic texts, specifically Abū Ma'shar's *Kitāb al-Madkhal al-kabīr ilā 'ilm ahkām al-nujūm*.

## Chapter 4

### Abū Ma'shar's Defense of Astrology

As mentioned in the previous chapter, Ptolemy's *Tetrabiblos* had a fairly straightforward transmission from the Greco-Roman world to the Islamic world. The text provided early astrologers with a solid defense of a demythologized astrology which made its incorporation into Islamic science easier, although still at odds with religious scholars and philosophers. Ptolemy's arguments, situated as they were within a tradition of defending one's practice, did not adequately address all the issues which arose in the early Islamic world which required adaptation of the defense. Abū Ma'shar, a prominent ninth-century astrologer, wrote a text on astrology which became very influential in the Islamic world and in late medieval Europe. His defense is much longer and more in depth than Ptolemy's defense, but his method of defending astrology bears a strong resemblance to that found in the *Tetrabiblos*.

#### 4.1 Life and Works

Ja'far ibn Muḥammad Abū Ma'shar al-Balkhī, the author of *Kitāb al-Madkhal al-kabīr ilā 'ilm aḥkām al-nujūm*, or *The Great Introduction to the Science of the Judgments of the Stars*, was born in or near the city of Balkh, located in modern-day Afghanistan, in 787. The date and location of Abū Ma'shar's birth comes from a horoscope he himself cast and reported in the third book of *Kitāb al-Madkhal al-kabīr*, the specific date being 10 August 787 at a latitude of 36 degrees.<sup>1</sup> After the conquests of Alexander the Great, Balkh was a center of Hellenistic culture, but by the mid-seventh century when the city was conquered by al-Aḥnaf ibn Qays, under the caliphate of 'Uthmān, it was, like the city of Ḥarrān, a place where many different cultures and

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<sup>1</sup>Pingree. 1962, p. 487, note 6. Yamamoto contests the traditional dates for Abū Ma'shar's birth and death, citing al-Bīrūnī's *Chronology of Ancient Nations* in which he makes reference to an observation made by Abū Ma'shar in 892 and an observation recorded by Abū Ma'shar himself made in 896/897. See Yamamoto. 2007, p. 11.

religions mingled, particularly with the remnants of the Sasanian empire. These cultures included not only the Greek, but also Indian, Chinese and Scythian, as well as Jewish, Nestorian, Manichaean and that of the dominant religion of Zoroastrianism, placing Abū Ma'shar in a multicultural region with beliefs and cultures sympathetic to the tenets of astrology.<sup>2</sup> This region was also a source for many of the Abbasid intellectuals and translators in spite of the pro-Iranian (and anti-Arab) attitude which was prevalent during the early years of the Abbasid dynasty. Abū Ma'shar came from the third generation of the "Pahlavī-oriented intellectual elite."<sup>3</sup> However, he was, according to Ibn al-Nadīm, "first a scholar of the Ḥadīth" and came to Baghdad at the beginning of the reign of al-Ma'mūn (813-833) on his way to Mecca for the *hajj*, a journey he never completed.

While in Baghdad, he became acquainted with 'Alī ibn Yahyā al-Munajjim, an astrologer well-connected to the caliph al-Mutawakkil (847-861), and learned from him and from his library.<sup>4</sup> Abū Ma'shar also became a part of the Arabic intellectual milieu and, according to Ibn al-Nadīm, met al-Kindī, to whom he was initially antagonistic because of his devotion to philosophy, meaning that Abū Ma'shar was more than likely a conservative religious scholar.<sup>5</sup> He did not begin studying the judgments of the stars until he was forty-seven years old, after a brief

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<sup>2</sup>Pingree. 2008, p. 32.

<sup>3</sup>Pingree. 2008, p. 32.

<sup>4</sup>Saliba. 1992, pp. 348-349.

<sup>5</sup>Ibn al-Nadīm/Dodge (trans.). *Fihrist*, p. 656. Richard Lemay questions this identification, noting that another Abū Ma'shar living in the eighth century would fit that description much better than the famous astrologer. See Lemay. 1995, p. 6. Manfred Ullmann also points out the possible confusion. See Ullman. 1972, pp. 316-317. Peter Adamson uses the anecdote as the starting point for his investigation into the relationship of the thought of Abū Ma'shar and al-Kindī without taking a position on its veracity. See Adamson. 2002, pp. 245-246.

foray into geometry and arithmetic, apparently instigated by al-Kindī himself as a challenge.<sup>6</sup> Other stories of Abū Ma'shar's "conversion" to astrology relate that he studied the discipline until he became an atheist, lured away from his religious studies by al-Kindī and his mathematics. As Saliba notes, it was not the arithmetic and geometry which were to be rejected. Rather, astrology was presented as a subject which had the ability to draw one away from the worship of God.<sup>7</sup> The anecdote of Abū Ma'shar's atheism reveals the risk faced by those who studied the foreign sciences. The aforementioned *ḥadīths* as well as later interpretations of them illustrate the stance of religious scholars on the topic of astrology within the expanding Islamic civilization.<sup>8</sup> Abū Ma'shar's studies of astrology led him to incorporate elements of his eclectic background as he attempted to understand and expand on the state of astrology in the ninth century. He included both his Pahlavī inheritance and the Greek and Ḥarrānīan influence dominating the intellectual circles in Baghdad. Lemay presents the possibility that Abū Ma'shar gained a reputation as an astrologer while still in Balkh and that his arrival in Baghdad should be dated to 826, after an anecdote of his casting the horoscope of the "king of the Hindus," meaning that he came to the Abbasid capital already trained as an astrologer.<sup>9</sup>

No matter when his reputation was firmly established, his work as an astrologer and his writings gained him some fame in Baghdad, leading to his eventual appointment as chief astrologer for the caliph al-Mu'tazz. During his tenure as the court astrologer, stories were told of his skills in divination. Ibn Khallikān, a thirteenth-century scholar, relates one in which Abū

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<sup>6</sup>Ibn al-Nadīm/Dodge (trans.). *Fihrist*, p. 656.

<sup>7</sup>Saliba. 1982, p. 215.

<sup>8</sup>Goldziher. 1981, p. 196.

<sup>9</sup>Lemay. 1995, pp. 13-14.

Ma'shar successfully divined, via his knowledge of the planetary movements, the location of an officer who had committed a crime against the prince, "on a mountain of gold, which mountain was in a sea of blood." However, the officer, knowing of Abū Ma'shar's skills, took steps to confuse the predictions. When he was finally given amnesty by the prince, the officer revealed how he had hidden himself on a golden mortar in a vessel filled with blood. According to Ibn Khallikān, the prince "was struck with admiration at the artifice he [the officer] had employed and the skill of Abū Ma'shar in making the discovery."<sup>10</sup>

Whether he was the ex-religious scholar Ibn al-Nadīm describes or simply a believer in astrology, Abū Ma'shar's works, as listed by Ibn al-Nadīm, are almost exclusively astrological in nature, ranging from *The Great Introduction to the Science of the Judgments of the Stars* to *The Book of Religions and Dynasties* (on the subject of historical astrology) and his works formed much of the basis for later astrology both in the Islamic world and in the Latin West. Ibn Khallikān described Abū Ma'shar as "the celebrated astrologer" and the "great master of his age in that art."<sup>11</sup> Modern historians such as David Pingree have questioned the validity of Abū Ma'shar's reputation as a great astrologer, describing him as "an interesting and instructive phenomenon," but that he is "not to be ranked among the great scientists of Islam" mostly due to his lack of innovation or original thinking.<sup>12</sup> Regardless of current perceptions of his skills, during his own lifetime and even four centuries after his reported death in 886, i.e. at the age of one hundred,<sup>13</sup> Abū Ma'shar had a reputation as an astrologer and his works were known and

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<sup>10</sup>Ibn Khallikān/de Slane (trans.). *Biographical Dictionary*, vol. 1, p. 325.

<sup>11</sup>Ibn Khallikān/de Slane (trans.). *Biographical Dictionary*, vol. 1, p. 325.

<sup>12</sup>Pingree. 2008, p. 35.

<sup>13</sup>Ibn al-Nadīm/Dodge (trans.). *Fihrist*, p. 657.

valued.<sup>14</sup>

#### 4.2 *Kitāb al-Madkhal al-kabīr ilā ‘ilm aḥkām al-nujūm*

The title of Abū Ma‘shar’s text has a few variations based on the manuscript used. In general, it is translated as *Great Introduction to the Science of Judgments of the Stars*. The word *aḥkām* is generally translated as *judgments*, although it has more specific meanings in Islamic law, as well as general meanings like *authority* or *decision*. The *judgment* sense of *aḥkām* also can be seen in the Latin title *Liber Introductorii maioris ad scientiam judiciorum astrorum*, where the word *aḥkām* is translated as *judiciorum* (singular: *judicium*) which can refer to a trial, a decision or a judgment. Most of the manuscripts vary only in the preposition used. The title used by Lemay is *Kitāb al-Madkhal al-kabīr ilā ‘ilm aḥkām al-nujūm*. He does note that the oldest manuscripts do not contain *al-kabīr*, but that it was added in later, possibly due to Ibn al-Nadīm’s differentiation between the text and Abū Ma‘shar’s abridgement, calling the first large, *al-kabīr*, and the second small. The Latin translations preserved the titles based on their respective sizes.<sup>15</sup> The manuscript Bibliothèque Süleymaniye Library Istanbul, Carullah 1508 has, instead of *ilā ‘ilm aḥkām al-nujūm*, *fī ‘ilm aḥkām al-nujūm*, and the Carullah 1508 has a full title which is much longer than that found in any other manuscript.<sup>16</sup> One manuscript, Istanbul, Halet Efendi 541, contains no title and simply begins with a formulaic *al-ḥamdu lillāh*.<sup>17</sup> The Leiden University Library, Cod. Or. 47 has a title, but it is much shorter than Carullah 1508 and also shorter than

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<sup>14</sup>Ibn al-Nadīm gives a list of all the works of which he is aware, and Ibn Khallikān mentions three by name in his account: *al-Madkhal*, *al-Zīj*, and *Kitāb al-Ulūf*.

<sup>15</sup>Lemay. 1995, p. I. For Ibn al-Nadīm’s brief description of both works see Ibn al-Nadīm/Dodge (trans.). *Fihrist*, p. 657.

<sup>16</sup>Lemay. 1995, p. 140.

<sup>17</sup>Lemay. 1995, p. 154.

the title Lemay uses. On the first page of the text, it is introduced as *Kitāb al-Madkhal al-kabīr li-Abī Maʿshar al-Balkhī*.<sup>18</sup> In this chapter, I will use Lemay's title and the common shortened form, *Kitāb al-Madkhal al-kabīr*, to refer to Abū Maʿshar's text.

Unless otherwise noted, all translations are my own, with citations coming from Lemay's edition.<sup>19</sup> He evaluates previous lists of surviving manuscripts made by Carl Brockelmann,<sup>20</sup> Manfred Ullmann,<sup>21</sup> and Fuat Sezgin.<sup>22</sup> There is considerable overlap in the various lists, but Lemay points out that there are errors in the manuscript lists given by Brockelmann and Ullmann which are then reproduced by Sezgin.<sup>23</sup> Following his analysis of the previous lists, Lemay provides a list of nine manuscripts he considers valid texts. The age of these texts ranges from the Paris, Bibliothèque Nationale ms arabe 5902 which is dated to 936 to the Istanbul, Nuruosmaniye 2806 which is dated to 1736.<sup>24</sup>

*Kitāb al-Madkhal al-kabīr* is widely considered one of the more influential medieval astrological texts. It was vital for astrology in Islam and was significant in medieval Europe after being translated into Latin at least twice. The structure of *Kitāb al-Madkhal al-kabīr* is similar to that of other works on astrology, both before and after his publication. The work is divided into

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<sup>18</sup>Lemay. 1995, p. 159.

<sup>19</sup>Charles Burnett and Keiji Yamamoto are preparing a new Arabic edition and English translation but I have not had access to it.

<sup>20</sup>As found in Brockelmann. 1943.

<sup>21</sup>As found in Ullmann. 1972.

<sup>22</sup>As found in Sezgin. 1979.

<sup>23</sup>Lemay. 1995, p. 117.

<sup>24</sup>Lemay. 1995, p. 118. For a detailed examination of each of the manuscripts Lemay uses, see pp. 119-172.

eight books, and each book is further divided into sections. Book one is the introduction in which Abū Ma'shar presents his defense of astrology, his aims in writing it, the ways in which it is beneficial and how it relates to other practices. Books two through eight address the various aspects of astrology from the signs of the zodiac and the different spheres surrounding the earth to the planets, their aspects and powers, to the more technical parts of astrology, e.g. the houses, exaltations, lots and how they function in the casting of a horoscope. Within books two through eight, Abū Ma'shar presents astrology with little comment on its validity and without mention of arguments against it. It is implicit within the text that he considers what he is presenting as true. This is similar to the handbook on astrology written by al-Qabīṣī<sup>25</sup> in the tenth century. Al-Qabīṣī refers his readers to a previous work in which he lays out his defense of astrology, a text which is, unfortunately, no longer extant. Abū Ma'shar's introduction is the section set aside for presenting the philosophical ideas about astrology, and like Ptolemy before him, uses the whole of the introduction of his *Great Introduction to Astrology* to present the most thorough defense of astrology in the Islamic world. This is where he lays out his ideas about the efficacy and validity of astrology and his arguments against those who would deride astrology as a falsity.

The introduction itself is divided into six parts. The first is a brief introduction and summary of what the book covers. The second part is on the existence of the judgments (*al-ahkām*). In it, Abū Ma'shar presents the beginning of his definition of astrology and makes a number of comparisons between astrology and other arts. The third part describes how the stars operate in the world, i.e. the manner in which influence arises and of what type it is. In this section, Abū Ma'shar invokes both Ptolemy and Aristotle in support of his ideas about the movements of the planets and how they impact the earth below them. The fourth section

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<sup>25</sup>See Burnett, Yamamoto and Yano (trans.). 2004.



describes the importance of the various forms of the planets and stars. Essentially, the shape of the planets and the composition of them is what imparts their innate properties and, by extension, what power and influence they have on the earth. Parts five and six are the sections most devoted to justifying the practice of astrology. Part five is organized based on Abū Ma'shar's replies to what he describes as the various methods used to attack astrology. There are ten groups of people to whom he responds: those who simply say that the planets are not signs of events on the earth, those who say that the planets *are* signs but not of individuals, the philosophers who argue that the planets cannot show the possible, those who know astronomy and dismiss astrology because of their supposed knowledge, those who dismiss astrology because knowledge of it can only come from experience, the mathematicians who look at *zīj*s (sets of astronomical tables) and dismiss astrology because some of the *zīj*s are wrong, those who are simply envious of the success of skilled astrologers, those who pretend to be doctors but do not really understand their art, those who simply are ignorant of astrology, and finally, those of the general public who see and dismiss those who claim knowledge but really possess no understanding of the planets. Abū Ma'shar presents each group's arguments and then, summarily, dismisses them, putting more emphasis on those which he considers to be the more important arguments. Part six describes how astrology is a useful practice, one to be encouraged, not dismissed. Abū Ma'shar again uses a number of examples and analogies to support his claim. The conclusion of his defense is a brief summary of the main points.

### 4.3 Reception and Transmission

Abū Ma'shar's *Kitāb al-Madkhal al-kabīr* was published around 850 A.D. and from that time was held as one of the most thorough treatises on the practice of astrology. However, as popular as Abū Ma'shar's work became, astrology continued to hold an uncertain position within

the Islamic world, one which, officially at least, became more shaky as time passed. Attacks on the practice and validity of astrology came from both sides: the Muslim leaders who objected on religious grounds and the scholars whose own work in the foreign sciences linked them with the religiously-objectionable astrology, a relationship many of them desired to avoid. Although the focus of this paper is not the polemical astrological literature, a brief presentation of the status of astrology within Islam will help situate it more firmly within the appropriate historical context.

Even within works on astrology, the questionable nature of its practice can be seen. The famed eleventh-century astronomer al-Bīrūnī wrote a handbook on the practice of astrology, *Kitāb al-Taḥḥīm li-awā'il ṣinā'at al-tanjīm*, at the request of Rayḥāna, the daughter of al-Ḥasan, in order to help her in her instruction,<sup>26</sup> but even though this text is teaching about the practices of astrology and the knowledge needed to understand it, al-Bīrūnī cannot avoid giving his opinion of the art: “By the majority of people, the decrees of the stars are regarded as belonging to the exact sciences, while my confidence in their results and in the profession resembles that of the least of them.”<sup>27</sup> Although he does not completely dismiss astrology, he does place it on the lowest level of the sciences, giving the impression that the attention it receives is wasted. Al-Bīrūnī also seems to distance himself from the practice. He may be writing a guide for it, but he himself is not one of the astrologers. Much of the handbook is simply relaying the methods, but in those places which require additional commentary, al-Bīrūnī generally writes of what the astrologers say, not what he says. In contrast, many of Abū Ma'shar's statements are given in first person making it likely that he was aligning himself with the astrologers, as one of their number. Al-Bīrūnī's views on astrology are much more openly-negative in other works, including the

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<sup>26</sup>Al-Bīrūnī/Wright (trans.). *Kitāb al-Taḥḥīm li-awā'il ṣinā'at al-tanjīm*, p. 1.

<sup>27</sup>Al-Bīrūnī/Wright (trans.). *Kitāb al-Taḥḥīm*, p. 210.

*Āthār al-Bāqiyya* in which he attacks astrologers as those who

excite suspicion against – and bring discredit upon – astronomers and mathematicians, by counting themselves among their ranks, and by presenting themselves as professors of their art, although they cannot even impose upon anybody who has only the slightest degree of scientific training.<sup>28</sup>

Able to give his own opinion, al-Bīrūnī is decidedly against astrology and its practitioners. Even later religious scholars, such as Ibn Taymiyya discussed below, separated the practice of astrology from that of astronomy with the intent of condemning the former and embracing the latter.

Nor were astronomers the only members of Islamic society to condemn astrology. As mentioned above, numerous attacks on astrology were published after Abū Maʿshar's works. Mathematicians and philosophers, as other members of those practicing the foreign sciences, also condemned astrology both on grounds of its lack of validity and its tarnishing of the other foreign sciences. Saliba states that with a single exception, “no philosopher of any repute would defend astrology” and this seems to be the common attitude by the intellectual elite.<sup>29</sup>

From a religious standpoint, the condemnation of astrology had been official from before Abū Maʿshar's day,<sup>30</sup> but perhaps the most eloquent religious attack on the science came from Ibn Qayyim al-Jawziyya in the fourteenth century. Ibn al-Qayyim was taught by the famous Mamluk muftī Ibn Taymiyya (1263-1318) who, himself, wrote against the practice of astrology. Ibn Taymiyya's condemnations take the form of three *fatwās* of varying lengths in which he explains

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<sup>28</sup>Al-Bīrūnī, as quoted in Saliba. 1982, p. 219.

<sup>29</sup>Saliba. 1982, p. 216.

<sup>30</sup>Another example of earlier condemnations is that of Ibn Sīnā, particularly his aforementioned separation of astronomy and astrology. See, e.g., Michot and Teissier. 2006. The fourteenth-century historian, Ibn Khaldūn, also took time to condemn astrology in his *Mutaqaddimah*, see chapter VI, section 31.

why it is that believing Muslims should shun the practice.<sup>31</sup> In the view of Ibn Taymiyya, astrologers are, at best, liars seeking to deceive their clients. The underlying issue is that “the edifice of their science is based on [the premise] that the superior movements are the cause of events [in this world] and that knowing the cause necessarily yields the knowledge of what is caused (*musabbab*).”<sup>32</sup> Here, determinism is raised as an issue by an opponent of astrology, pointing out that doctrine as being the major flaw in the practice. Anyone who “believes that this planet is what administers (*mudabbir*) him, he is an unbeliever” and has a “corrupt belief.”<sup>33</sup> Thus, it is required of every Muslim to condemn astrology and prevent its practice. “This is indeed among the most important things that God has made incumbent, as far as commanding what is to be acknowledged and prohibiting what is to be condemned are concerned.”<sup>34</sup> The other two *fatwās*, although considerably shorter than the first, are also clear in their condemnation of astrology and of its public practice.

In the context of Ibn Taymiyya’s obvious opinions on astrology, it is little wonder that his more famous disciple, Ibn al-Qayyim, would follow in the same view. For him, astrologers were usurping God’s power in claiming to predict the future. Not only that, but astrology is, at its heart, an irrational practice, devoid of truth. “Its practitioners merely follow a tradition absent of

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<sup>31</sup>For a complete translation of the three *fatwās* along with a brief introduction to Ibn Taymiyya and the state of astrology under the Mamluks, see Michot. 2004.

<sup>32</sup>Ibn Taymiyya/Michot (trans.), *Fatwā I*, p. 291. Ibn Taymiyya also goes on to elaborate on the impossibility of knowing every single little cause which could lead to an event. God is the ultimate cause, of course, but his discussion of intervening causes sounds very similar to the Stoic idea of the networks of causes.

<sup>33</sup>Ibn Taymiyya/Michot (trans.), *Fatwā I*, p. 297.

<sup>34</sup>Ibn Taymiyya/Michot (trans.), *Fatwā I*, p. 317.

all proof and verification.”<sup>35</sup> In order to prove the utter falsity of astrology, Ibn al-Qayyim uses a series of examples which demonstrate that there is no power in the movements of the heavens. His list bears similarity to Cicero’s list of events in *De divinatione* where reliance on astrology ruined many people’s lives and Manilius’ list in *Astronomica* in which the movements of the planets determined the course of events. In addition, Ibn al-Qayyim employs the common argument about stellar influence and how far it goes. For him, as for most critics of astrology, it is obvious that the earth is affected by the motions of the sun and the moon. He also goes as far as to admit to some effect on the different ethnicities depending on their particular clime. However, anything beyond that is wrong and is, in fact, not only ridiculous, but also attacking the power of God.<sup>36</sup> Like Ibn Taymiyya, Ibn al-Qayyim also separates legitimate science from astrology. The knowledge of science is an area that should be studied along with religion, but never in place of it. So long as the rational sciences are studied in the proper way, they are of value, particularly in removing the belief in and practice of the occult sciences which are evil.<sup>37</sup> Ibn al-Qayyim’s stance on determinism, although certainly not coming from the same angle as that of Abū Ma’shar, is remarkably similar to that which is presented in Book I of *Kitāb al-Madkhal al-kabīr*. He advocates neither unbridled free will nor strict determinism. Instead, a true Muslim “stands between them [determinism and free will], believing in his free will yet at the same time knowing he is under God’s will and thus powerless to do what God has not willed, for

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<sup>35</sup>Ibn al-Qayyim/Livingston (trans.), *Miftāh dār al-sā’āda wa manshūr wilāyat al-‘ilm wa-al-irāda*, p. 469 in the 1939 edition, edited by Maḥmūd Ḥasan Rabī’a. Quoted in Livingston. 1992, p. 600.

<sup>36</sup>Livingston. 1992, p. 603.

<sup>37</sup>Livingston. 1992, p. 608. Ibn al-Qayyim extended this condemnation to the practice of alchemy as well as astrology. See, e.g., Livingston (1971).

otherwise the Almighty's power would be diminished."<sup>38</sup> Where Abū Ma'shar speaks of the stars determining the course of a man's life and yet the man having the ability to change that course, Ibn al-Qayyim says that a man will believe in free will and yet know that God has power over all. In the same manner, he also navigates a middle course between the type of cause-and-effect relationship which allows for predicting the future and one of complete discontinuity between moments.<sup>39</sup> As similar as their positions may be on a general level, Ibn al-Qayyim gives no place for the existence of astrology within his framework. It is utterly false and has no claim to truth in any respect, be it scientific or otherwise.

Even the continuous attacks on astrology could not prevent the continuation of the practice. Treatises and handbooks were published throughout the Abbasid era and the practice of astrology continued to be as popular as ever. Astrologers, although officially condemned both scientifically and religiously, carved out a niche for themselves, one that allowed them to function as workers of any other occupation did. As Saliba notes, the practice of astrology was condemned, but it was also regulated, an acknowledgment of its popularity.<sup>40</sup> In addition, the attacks discussed above speak to the existence of a widespread practice which the polemical writers felt a need to restrict or eliminate altogether. Ibn al-Ukhuwwa wrote a text in which he attempted to regulate the common practice of astrology in the fourteenth century, long after the peak of astrological research in the ninth and tenth centuries.<sup>41</sup>

The perpetuation of astrology in the Islamic world was not confined to the eastern

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<sup>38</sup>Ibn al-Qayyim/Livingston (trans.). *Miftāh*, p. 590. Quoted in Livingston. 1992, p. 609.

<sup>39</sup>Livingston. 1992, pp. 609-610.

<sup>40</sup>Saliba. 1990, pp. 356-357.

<sup>41</sup>Saliba. 1990, p. 357.

caliphates. Under the Spanish Umayyads in al-Andalus, astrology faced the same pattern of practice and condemnation which it did in the Abbasid caliphate. The first known Andalusī astrologer is al-Ḍabbī who served the Umayyad emir, Hishām I (788-796). Subsequent emirs also used the services of court astrologers even after the burning of the library (specifically astrological texts) of al-Ḥakam II (961-976).<sup>42</sup> As it had in the east, astrology went through periods of acceptance and rejection throughout the centuries, but the practice does not seem to have died out, even surviving the orthodoxy of the Almoravids which followed the pinnacle of astronomical and astrological research in al-Andalus during the eleventh century.<sup>43</sup> The process by which Abū Maʿshar’s work arrived in al-Andalus is not known, but George Hourani’s work following the development of the so-called “foreign sciences” in the ninth century can at least be taken as an indication of how such a transmission may have occurred. It took more time for these sciences to develop in al-Andalus than they had in the eastern empire simply because of the differences in the conquered cultures. Medieval Spain was located on the frontier and was comparatively undeveloped both in terms of intellectual foundations and in terms of cultural centers. The initial educational impetus took place strictly within a religious and legal context. With the official condemnation of some of the foreign sciences (including astrology), it was more difficult for them to gain a solid foothold in al-Andalus.<sup>44</sup> Even so, particularly under ‘Abd al-Raḥmān III (912-961) and al-Ḥakam II, secular learning was patronized and encouraged. The emirs brought in scholars from the east as both practitioners and teachers.<sup>45</sup> It was in this manner

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<sup>42</sup>Samsó. 2003, pp. 525-526. For more details on al-Ḍabbī, see also Samsó. 1979, pp. 228-229.

<sup>43</sup>Samsó. 2003, pp. 526-527.

<sup>44</sup>Hourani. 1970, pp. 143-156.

<sup>45</sup>Lindberg. 1978, p. 58.

that the scientific texts were collected and groups of scholars arose around those which survived the occasional purges of the rulers of al-Andalus.

The interactions between al-Andalus and Europe, often commercially-based, created a situation in which there was mostly-free movement throughout the Iberian peninsula, allowing European scholars to come and, along with native Spaniards, begin the translations from Arabic into Latin, which is generally regarded as the impetus behind the European intellectual resurgence in the twelfth and thirteenth centuries. Abū Ma'shar's abbreviated introduction to astrology was first translated by Adelard of Bath (fl. 1116-1142) in the first part of the twelfth century,<sup>46</sup> but during the same century, John of Seville (fl. 1133-1142), likely a Mozarab, completed the first Latin translation of *Kitāb al-Madkhal al-kabīr* under the title of *Introductorium maius in scientia astrorum*. In addition, Herman of Carinthia (fl. 1138-1143) made a translation under the title of *Introductorius maior siue liber quadrifariam partibus de indagatione cordis; Introductorium in astrologia Albumasar Abalachi qua de causa et post astronomiam*.<sup>47</sup> These translations, along with some of his other works became one of the foundations of European astrology at the end of the Middle Ages,<sup>48</sup> effectively altering the European astrological tradition.

#### 4.4 Abū Ma'shar's Defense of Astrology

Although the full defense of astrology in *Kitāb al-Madkhal al-kabīr* consists of approximately 1300 lines of Arabic text in the Lemay edition, the techniques Abū Ma'shar uses to present astrology as a valid source of information can be categorized in four areas: the

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<sup>46</sup>Lindberg. 1978, p. 62.

<sup>47</sup>Carmody. 1956, pp. 88-90.

<sup>48</sup>For a brief discussion of the Latin translations of *Kitāb al-Madkhal al-kabīr*, see Lemay. 1995, pp. 192-197.



definition of astrology and its relation to astronomy, his use of analogies and comparisons with other arts, the benefits which arise from the practice of astrology, and how astrology works, i.e. the degree of determinism and free will found in it. These areas appear to be very similar to Ptolemy's defense in his *Tetrabiblos*, and on the surface each section seems to be merely an expansion of the arguments Ptolemy used, but what Abū Ma'shar creates is a thorough defense of astrology as a valid art which can lead one to sure knowledge and can improve one's life, and one that is much more than a retreading of the defense in the *Tetrabiblos*.

#### 4.5 Astronomy vs. Astrology - Abū Ma'shar's definition

In order to understand Abū Ma'shar's point of view on astrology as a useful practice, it is important to understand his view of the world, and more importantly for this discussion, how he views the relationship between astronomy and astrology. In section two of his introduction, Abū Ma'shar presents his view of the world in general and of astrology and astronomy. As Ptolemy had done centuries before, Abū Ma'shar separates the two sciences from each other, saying that there are two types of knowledge which can come from the study of the stars. The first is the science of the whole or of everything (*ilm al-kull*) which covers the study of the quantity and quality of the celestial spheres, the planets, their shapes and sizes, the velocities, in short, the observable facts about the sky.<sup>49</sup> It is the science of Ptolemy's *Almagest* and is found by means of "clear, indisputable evidence which comes from the science of arithmetic and of geometry and of surveying. Doubt does not mix with it and the senses accept it. This science is not refuted unless [one] resists the truth."<sup>50</sup>

The second science is the science of the judgments or astrology, and it relies on the first

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<sup>49</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.95-115.

<sup>50</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.111-113.

science. Abū Maʿshar described it as the “natural knowledge of each planet and each sphere and the property of their meaning and what occurs due to the power of their different movements and their nature.”<sup>51</sup> Like astronomy, the science of the whole, astrology relies on “clear analogies (or syllogisms)” (*al-qiyāsāt al-wāḍiḥa*) and on the understood powers of planetary motions and effect of their distance on the earth. Abū Maʿshar describes those who would try and reject or refute this science as those who are “distant from knowledge and discrimination and [from] the knowledge of the conditions of the celestial bodies.”<sup>52</sup>

In this separation of astronomy and astrology, Abū Maʿshar is similar to Ptolemy in presenting astrology as relying on astronomy, but where Ptolemy begins by placing astrology beneath astronomy, calling it the “less self-sufficient method” and describing it as lacking the “sureness of the first,” i.e. astronomy, because of its location in the sublunar realm,<sup>53</sup> Abū Maʿshar describes both sciences as resulting in knowledge and people who would refute either one as ignorant of or ignoring truth. However, there is a difference in how the two scholars discuss the acquisition of knowledge. Burnett notes the differences in their choices of words when describing how knowledge is acquired via astrology. For Ptolemy, knowledge of astronomy comes through demonstration. Astrology, although knowable through observation of the apparent regular occurrences of the sun and moon, is more uncertain because of the changing elements of the sublunar realm and because the heavens never fully return to their same state.<sup>54</sup> In contrast, Abū Maʿshar, in Burnett’s opinion, generally avoids the use of the Arabic word for demonstration

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<sup>51</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.116-117.

<sup>52</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.125-126.

<sup>53</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.1.

<sup>54</sup>Burnett. 2002, p. 199-200. See also Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.

(*burhān*), speaking instead of the use of analogy (*qiyās*) in proving the veracity of astrology.<sup>55</sup>

Astrology, in Abū Maʿshar's view, is a way to truth and is learned from those who came before, even without the use of demonstration. By studying the movements of the planets in depth, astrologers may draw important conclusions of what the planets do in the changing of the seasons and of the natures of things on the earth.<sup>56</sup> Here, where Ptolemy places astronomy over astrology, Abū Maʿshar states that

the second science [astrology] is the fruit of the first science [astronomy] because the wise man, if he knows the quality of the movements of the spheres and the planets and their quantity, the result is that he knows what the power of those movements show and the states of the things in the world. *And if he does not know what the planets signify by their movements, then, the first type of the science of the stars has no result.*<sup>57</sup>

Without astrology, astronomy is useless, a rebuttal against the idea becoming prevalent among the astronomers in the Islamic world, mentioned above, that astrology was the “Achilles heel through which one could launch attacks against these imported foreign sciences and philosophies.”<sup>58</sup> This perceived weakness led some astronomers to reject astrology in order to preserve their own science, but for Abū Maʿshar, astrology is the purpose of studying astronomy and the two sciences are inseparably connected. In contrast, Ptolemy describes astronomy as being “desirable in itself *even though it does not attain the result given by its combination with the second.*”<sup>59</sup> Where Abū Maʿshar argues that astronomy has no value without the results available from astrology, Ptolemy acknowledges the lack of practical results but states that

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<sup>55</sup>Burnett. 2002, pp. 205-206.

<sup>56</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.173-176.

<sup>57</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I. 891-894.

<sup>58</sup>Saliba. 1992, p. 347.

<sup>59</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.1.

astronomy is desirable even without those results.

#### 4.6 *Al-qiya's* - Abū Ma'shar's use of comparisons and analogies

It is one of the particular methods of defenders of astrology to use the more obvious influences of celestial objects on the earth as evidence of less perceptible influences, extrapolating via analogy how the movements of the planets can affect the sublunar realm.<sup>60</sup> The changing position of the sun has an obvious impact on the weather and the seasons. The moon stops in its various mansions (*manāzil*) throughout the months and allows nations to “know what happens in the days of the year from heat and cold and winds and rains and other changes of the weather.”<sup>61</sup> Plants grow in clear relation to the sunlight they receive. The cycles of plants, metals, animals, and even the sea, all are in relation to the movements of the sun and moon. If these obvious signs of celestial influence are valid, then why not particular signs as well? Comparisons and analogies to different types of celestial influences as well as to other occupations gives Abū Ma'shar another position from which to argue for the validity of astrology.

For Abū Ma'shar, astrology is a definite source of valuable information and he demonstrates his feelings on it and on the type of knowledge it gives by more than just comparisons with other celestial influences. Again, following Ptolemy, he makes comparisons between the knowledge gained by studying the movements of the stars and that gained by experience in other occupations from farming to ranching or animal husbandry to navigation and especially to medicine. Those who work at various jobs learn from previous experiences and from being taught what will come in the future. Farmers know what season will result in the best crops. Breeders know when is the best time of the year for their animals to breed. Sailors and

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<sup>60</sup>Adamson. 2002, p. 249.

<sup>61</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.160-162.

navigators know what time of the year is most advantageous for travel on the sea and they also know what times to avoid.

And all of them use what is in it from the good and bad, and they teach those who do not know it...and they inform (us) that they learned those [things] by their long study and their interest in the divisions of the year and its power and the path of the sun and the moon.<sup>62</sup>

All these people learn through study of the heavens how to be as successful as is possible in their chosen occupations. They know the movements of the heavens and they know how to apply that knowledge in practice.

As important as they are in terms of providing the analogous evidence, these other occupations are not Abū Ma'shar's main source of comparison. In what initially seems to be merely an interesting digression, he spends nearly forty lines (217-254) discussing the various signs for determining the gender of a child or the number of children a woman will bear based, not on celestial signs, but on the experiences of midwives in delivering babies. This is something determined by experience (*tajriba*) and depends on the appearance of the woman, e.g. the shape of her eyes, the shape and color of the abdomen and breasts. Their skill in making predictions improves based on "the length of their experience and by much of what they hear from predecessors who were experienced in these things in ancient times."<sup>63</sup> Abū Ma'shar continues with a description of how doctors diagnose diseases, and from this section, it is clear that his digression was not a digression at all but evidence of the value of experience in predicting future events. By studying what happened in the past, doctors can extrapolate how a disease will progress in the future. This idea of the value of previous experience has similarity to the Greco-

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<sup>62</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.195-198.

<sup>63</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.220-221.

Roman Empirical school of medicine which focused on observation of current illness and using records of past observations in order to make diagnoses.<sup>64</sup> The obvious analogy here is that, in the same way, an astrologer can study how the heavens have moved in the past and affected the sublunar realm and gain an understanding of what effect they will have in the future. Well-trained doctors use a variety of evidence in their work. Diagnosing a disease can depend on what is happening with animals at various times of the year, the differences in the air in certain parts of the countryside, the influence of various natures and properties on human bodies. More importantly for Abū Ma'shar's argument, doctors also rely on "how natures change due to the strength of the movement of the planets, like the heating power of the sun and the cooling power of the moon and what is observed from the workings of the planets due to their blending with the sun and the moon in every season."<sup>65</sup> Good doctors understand the effects of the celestial realm on the terrestrial realm and they take that into account when they practice medicine. As Ptolemy presented in the *Tetrabiblos* I.3, Abū Ma'shar relates medicine and astrology saying that

their [the doctors'] arts are nearer to the art of the stars than the arts which we mentioned before because the art of medicine is knowledge of the nature of the four elements and the bodies of animals, plants, stones, water, and their blendings and their properties... and the art of the stars is knowledge of what is affected by the movements of the planets, e.g. in the difference of the airs of countries and in the conditions of their people and the changing of their natures and the changes and composition of individual animals and plants and substances...<sup>66</sup>

The extensive similarities between the two arts make the comparisons between them valuable, in

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<sup>64</sup>The works of Galen were important in the transmission of the ideas of Empiricism. Hunayn ibn Ishāq (ca. 808-873), a contemporary of Abū Ma'shar, translated many of these works into Arabic from Syriac intermediaries. Anawati. 2008, pp. 230-234. See also the Hippocratic text *On Ancient Medicine*, e.g. part 2, for the importance of experience in the practice of medicine.

<sup>65</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.262-264.

<sup>66</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.266-271.

part because it will be easier to show astrology's usefulness and validity through the analogy of an art that pursues a similar goal. However, that is not the only reason for Abū Ma'shar's use of medicine.

Throughout Book I, Abū Ma'shar continues to bring up the comparison between medicine and astrology. For him, these are two arts which are inextricably connected, with doctors *needing* astrologers in order to practice effectively. Not only is medicine similar to astrology, but it also relies on astrology to be practiced successfully. In continuing his general trend of comparing astrology and medicine, Abū Ma'shar focuses on the work of doctors and how they use foreknowledge to practice their art. Using their knowledge of the humors and how the bodies react to the different seasons, doctors are able to treat diseases and they will know the cures for those diseases. "By his foreknowledge, the skilled doctor calms the strength of the evil mixtures and drives the illnesses from the man."<sup>67</sup> A knowledgeable doctor will be able to inform his patient of whether or not he will recover from his illness. In the same way,

since he saw, in his foreknowledge of the movements of the planets, that some people will be afflicted with something horrible, the knowledgeable astrologer proceeds by telling them because the foreknowledge of the art of the stars is very useful in terms of what afflicts the man from the horror in his future.<sup>68</sup>

These comparisons could lead one to assume that, like Ptolemy, Abū Ma'shar saw astrology and medicine as being equals, but there is a difference in Ptolemy's perception of astrology's place as a science versus that of Abū Ma'shar. Where Ptolemy presents medicine and astrology as both being equally given to error and being equally valuable in their respective spheres, Abū Ma'shar calls both medicine and astrology "universal" arts (*kulliyya*), but places astrology above medicine

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<sup>67</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1170-1171.

<sup>68</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1177-1180.

because doctors investigate and draw conclusions based on what they see in the sublunar realm while the astrologers draw conclusions based on the movements of the planets and it is the movements of the planets which cause the changes in the natures of things on the earth.<sup>69</sup> This comparison seems similar to Ptolemy's ranking of astronomy and astrology in the *Tetrabiblos*, but in this case, Abū Ma'shar is using the source of the observations in order to elevate astrology above medicine.<sup>70</sup> However, as Ptolemy addressed the occurrence of errors by even the best practitioners, so also Abū Ma'shar elaborates on the same issue, pointing out that people do not stop sailing or seeing doctors if an error is made even if death is the result as could be the case in a misdiagnosis of disease or faulty navigation. With regard to the art of astrology, "their errors are safer and less dangerous and their rightness is a greater advantage."<sup>71</sup> If an astrologer makes a mistake in his prediction, the worst that could happen is something that would happen anyway if the prediction had not been made at all. If the astrologer is correct, however, the benefits greatly outweigh that of any other art. In the end, the only reason people are able to reject astrology is

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<sup>69</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.288-301.

<sup>70</sup>Ptolemy is called "Ptolemy the wise," the author of the *Almagest*, although he is not referenced as a source for Abū Ma'shar's methods of defending astrology. In addition, although he mistakenly believes that the Ptolemy who wrote the *Almagest* is different from the Ptolemy who wrote the *Tetrabiblos*, he is explicitly aware of both works as can be seen in a short excerpt from Book IV which Heilen (2010) provides in n. 191: "There were a number of Greek kings immediately after the Two-Horned, Alexander, son of Philip, each of whom was called Ptolemy, namely ten, nine men and a woman. They lived in Egypt and their rule lasted 275 years. The majority of them were wise, and one of them was Ptolemy, the wise, who composed the book of the *Almagest* on the causes of the motion of the sphere and all the planets within it. Another of them composed a book on astrology and attributed it to Ptolemy, the author of the book of the *Almagest*. It is sometimes said that the very learned man who wrote the book of astrology also wrote the book of the *Almagest*. The correct answer is not known because of his (?) error, but the one who was the author of the book of astrology mentioned the natures of the planets and their causes in his book." The idea that Ptolemy was one of the Ptolemaic kings was a common belief which lasted well into the Middle Ages, both in Europe and in the Islamic world. See Burnett. 1998, pp. 340-343.

<sup>71</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.388-389.



because of their ignorance or the ignorance of those who profess to understand it. The subject matter, i.e. the movements of the stars and the influence which they bring on the earth makes astrology nobler than the other arts and the most worthy of study.

In part 5 of Book I, Abū Ma'shar addresses the various groups who reject astrology and their reasons for doing so. Two of the groups again require comparisons for the dismissal of their claims. The fourth group of critics of astrology are those who observe the science of the whole (*ilm al-kull*), or the astronomers. This group does not deny the power of the planets in influencing the seasons, but they reject the possibility of being a sign of individual people or animals. For Abū Ma'shar, it is only those who lie who can reject the power of the planets when they study their movements and admit their effect on the seasons of the year. Influence proven and accepted in one area can be extended, by analogy, specifically by a generalization, to another area. As Burnett explained, Abū Ma'shar relied on analogies throughout his defense of astrology.<sup>72</sup> Since it is clear that the seasons shift based on the movements of one of the planets, namely the sun, “the planets, then, by the power of their movements...signify what happens in this world.”<sup>73</sup> Again, Abū Ma'shar relies on the philosophers, those who link astronomy and astrology together as sister sciences and who affirm the power of the heavenly spheres. Aristotle, in particular, as a well-respected philosopher in medieval Islam, was used often by Abū Ma'shar to support his position. He claims that the philosophers know the power of the planets because “they [the planets] are higher and nobler than the bodies [on the earth] and it is clear, in the view of the philosophers, that it is due to their movements that generation and decay are in this world

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<sup>72</sup>Burnett. 2002, p. 206.

<sup>73</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.883-884.

by the will of God.”<sup>74</sup> This seems to be a reference to some Aristotelian ideas, including those found in *On Generation and Corruption* and *Generation of Animals* in which Aristotle ascribes coming to be and passing away to the power of the planets, especially the sun.<sup>75</sup>

The eighth group of critics are those who pretend to be doctors and who study medicine from the ancients without truly understanding it. They study medicine in order to make money and they reject astrology because of their ignorance of the connection between astrology and medicine. They may know one branch of medicine but do not have a comprehensive knowledge of it and thus are not real doctors because they did not “delve into the reading of ancient books on the art of medicine and on its structures and... did not know the nature of things nor the natures of the seasons and their similarities and differences.”<sup>76</sup> Abū Maʿshar cites Hippocrates and Galen as experts in medicine and claims that both knew “that the science of the stars is the cause of the science of medicine” and that the science of the stars is nobler than medicine and those who would claim that medicine is more important do not understand their art.<sup>77</sup>

Again and again throughout his defense, in order to justify a study of astrology, regardless of the type of information it can give, Abū Maʿshar draws an analogy between experience,

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<sup>74</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.887-889.

<sup>75</sup>For Abū Maʿshar’s use of Aristotelian ideas, see Saliba. 1992, p. 341, n. 1 and Lemay. 1962, e.g. pp. xxix-xxxiv.

<sup>76</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.1022-1024

<sup>77</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.1040-1045. Abū Maʿshar overstates Hippocrates’ views on astrology. While the Hippocratic author acknowledges the use of the risings and settings of the stars, he is not referring to astrology. See Hippocrates. *Airs Waters Places* II.14-17. Galen’s commentary on *Airs Waters Places* also demonstrates that Abū Maʿshar has exaggerated his views on astrology. Toomer’s translation of Book III, chapter 11 contains a degree of skepticism about the abilities of the “horoscope-casters.” Galen’s view is that most of them are “false prophets and mountebanks.” See Toomer. 1985, p. 199. However, Galen does advocate that those studying medicine also learn astronomy, one of the branches of the science of the stars.

medicine and astrology. By rejecting gaining a foreknowledge of events via the stars, he claims that one must reject gaining a knowledge of future events by means of experience and one must also reject the knowledge doctors have of the progress of a disease which they have gained by means of experience. The average person will use his experiences to help him know when the weather will change during the year from cold to hot and vice versa. He uses that same experience to tell him when it will rain in order that he might avoid being caught in a downpour. Everyone uses their knowledge gained through experience in this way and “each of the skilled uses the foreknowledge which comes through experience in their craft, e.g. masters of farming and planting and herding and obstetrics. They prepare in guarding against the calamities which they fear before they come.”<sup>78</sup> Through these analogies, Abū Ma’shar believes that he has gone a long way toward proving the validity of astrology. Unlike Manilius, he does not give lists of predictions which have been successful. Rather, he follows Ptolemy in presenting what he considers to be valid evidence of his claims for astrology. He does not rely on comparisons only, however. In addition, he presents an extensive defense of astrology on the basis of the benefits of it gives to a native.

#### 4.7 The Benefits of Astrology

The entire sixth section of Book I is “on the benefit of the science of the judgments” and shows that “the gift of the knowledge of things existing in this world due to the power of the movements of the stars is very beneficial.”<sup>79</sup> Here, Abū Ma’shar is defending astrology’s value as opposed to its validity. He begins by addressing the attitude that, even if astrology is a valid practice, it is useless and even detrimental to a man because if what happens is good, he will be

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<sup>78</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.1143-1145.

<sup>79</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.1108-1109.

happy even if he does not know about it and if it is bad, all he can do about it is worry and make himself miserable.<sup>80</sup> The only reason for holding this opinion, Abū Ma'shar claims, is because astrology's critics "do not know the virtue of this science nor its beneficial use." The man who knows the benefits of astrology "knows the benefit of the foreknowledge of existing things. However, those who reject the benefit of this science, reject this thing only because they do not know it."<sup>81</sup> If they really understood the value of foreknowledge, they would know that they use it all the time to make their lives better. The common person will use predictions of when cold weather comes to prepare for the lower temperatures, e.g. by wearing warmer clothes, or if he sees threat of rain, he will run to a protected place or else, again, put on clothes that will protect him from the storm.<sup>82</sup>

Returning once again to the practice of medicine, Abū Ma'shar also points out how doctors use their experiences with previous patients and the knowledge gained from their teachers in order to treat sickness and disease. This is something that the common person does not realize, but real doctors know and understand how to watch the times of the year and the airs around their patients in order to adequately treat them. Doctors also use knowledge from their predecessors about the humors in order to soothe or weaken the imbalance. As important as healing his patients, "if the doctor knows from some of what he takes as evidence among reliable signs that the illness will not disappear and his patient will not recover and that he will die in that illness, [then] the doctor will inform the patient that he is going to die" in order for the patient to

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<sup>80</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1110-1115.

<sup>81</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1116-1118.

<sup>82</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1123-1135.

have the time to prepare himself and his family for his impending death.<sup>83</sup> This important service provided by the doctor is a benefit to his patients, and it is a skill he has gained through his years of experience.

As he did in his comparisons with medicine, Abū Ma'shar uses the idea of the value of experience in order to demonstrate his views on the benefits of knowing future events via astrology. The arguments Abū Ma'shar presents in support of this idea are very similar to those in Ptolemy's *Tetrabiblos*. Everyone uses and desires foreknowledge in order to face whatever may be coming in their lives. No matter what the results of the prediction may be, it is worth knowing them. In order to prove this claim, Abū Ma'shar presents five possible outcomes of a prediction of an unpleasant event and why knowing about it is worthwhile. The first is when a widespread event, one that affects an entire city or region, is predicted that may or may not come to pass.<sup>84</sup> Knowing that it is coming allows for the preparation to hold off the hardship. In addition, knowing that something is coming prevents that event from creating extreme emotions in those affected by it.<sup>85</sup> The other four types are particular to an individual. The second type is when an adversity comes which, if it is known in advance, can be repelled. Obviously, there is a significant benefit to this be it an illness which can be prevented or steps which can be taken to avoid being attacked by an enemy. The third is the type of adversity in which only a part of it can be prevented or repelled if it is known in advance. Again, being able to alleviate an illness or make an attack less onerous is something worth pursuing. The fourth is the adversity that cannot

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<sup>83</sup> Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1168-1175.

<sup>84</sup> Abū Ma'shar calls it the *general*, or *ʿāmmiyya*, type. Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1180.

<sup>85</sup> This idea is one found in Manilius' *Astronomica*, Ptolemy's *Tetrabiblos* (I.3) and appears to be at least partially related to the Stoic idea of the value of controlling one's emotions.

be alleviated but the time in which it will remain is known which allows the sufferer to face it with equanimity. The fifth and final type of adversity is that which cannot be alleviated and cannot be repelled, e.g. when one learns that death is coming. Knowing death is imminent allows him to prepare for his death, arranging his affairs and settling any remaining problems. In every instance, it is useful to have the foreknowledge offered by astrology.<sup>86</sup> It does not matter whether or not one can prevent the tragedy from occurring. If he cannot then at least he will be able to prepare for the coming suffering. For such events as famines, even if the famine itself cannot be prevented, if a man knows it is coming, he can lay up stores or make arrangements for the time period when food will be scarce. In so doing, he is not changing the event, but rather, due to his foreknowledge, he is changing its impact upon him. Such value can be seen in all the variations Abū Ma'shar listed. If a man is able to change a coming event, then, the knowledge is useful. If he will only be able to partially change it, there is still value. If all he can know is that it will leave him after a time, that gives him patience and hope. Finally, even if, like the doctor, all the astrologer can do is tell the native that his life will end, he will be prepared for his death and will be able to avoid the problems which can arise from sudden death.<sup>87</sup>

The next part of Abū Ma'shar's claim of the benefits of astrology is combatting the argument he says is common for the public (*fahm al-ʿāmma*), i.e. that

it is not necessary for man to examine the science of the stars because he might see in the stellar phenomenon that an adversity is given at a certain time; instantly, he will worry because of that knowledge and then that sorrowful knowledge will follow him as will the thought of it.<sup>88</sup>

This idea is ridiculous because, according to Abū Ma'shar, if people avoid things that will cause

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<sup>86</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1180-1186.

<sup>87</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1187-1224.

<sup>88</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1238-1241.

them worry, they have to avoid traveling, making money, forming new acquaintances, because all of those things can cause anxiety due to the uncertain nature of the safety of travel, the security of one's money and the question of whether or not a new acquaintance can be trusted. Knowing what the stars have foretold removes the anxiety because what is coming is already known. One can avoid dangerous journeys if he knows that the outcome will be disastrous. Reiterating the same point, Abū Ma'shar, again describing the public perception of astrology, claims that people have advocated avoiding astrology because of the anxiety that arises in knowing what is coming and one should avoid all sources of anxiety. Again, he claims this is ridiculous because that means that one should avoid even events which cause joy, because at the end of those events, there will be sorrow for the cessation. In rejecting this perception, Abū Ma'shar reiterates the need for emotional calm. One can be overcome by both extreme sorrow *and* extreme joy. This should be avoided and foreknowledge which can be achieved by studying the science of the stars is the way to preserve one's equanimity.<sup>89</sup>

As a method of illustrating the beneficial nature of astrology, Abū Ma'shar explains that the ability to feel happiness and sadness is what sets human beings apart from inanimate things, and man's ability to know things in advance is what sets him apart from animals who can also be happy or sad. Foreknowledge allows him the chance to avoid those things which could cause him sadness and to prepare for the joy of good things.<sup>90</sup> People find happiness through things like music and are able to enjoy the sound of singing or the playing of musical instruments even though that may lead to disappointment when the music stops. In fact, if one should avoid

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<sup>89</sup>John of Seville's Latin translation ends after this argument but five extant Arabic manuscripts continue, see Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1288 and p. 109 of the Notes.

<sup>90</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1289-1299.

knowing things in advance because of the disappointment and anxiety in knowing the end of pleasant things, Abū Ma'shar claims that a man should avoid eating good food and having sex with beautiful women because those things will eventually end. Instead, "it is necessary that he force himself to eat of the worst foods and to drink of the worst drinks and to avoid sex and if he does have sex, he does so with the ugliest and most repugnant women"<sup>91</sup> because that way he will not be as disappointed when those things cease. Abū Ma'shar's argument here seems to be rather tongue-in-cheek, but he quickly returns to his insistence that astrology does not make a man more miserable. In contrast, a man who has foreknowledge of a happy event will be able to be happy longer simply in the anticipation of that event which makes the pleasure gained from astrology even better than that of something like music which must cease at some point.<sup>92</sup> The benefits also arise in more negative situations such as when someone is lost or a fugitive or when a person's intentions are not known. In each case, consulting an astrologer for aid will allow one to get rid of the uncertainty and know what is coming. No matter the situation, there is a benefit to knowing the future. "As for the man of incomplete happiness, he takes steps toward completing that happiness, and as for a happy man, he takes steps toward the continuation of his happiness."<sup>93</sup>

#### **4.8 Determinism in Abū Ma'shar's Astrology**

The final element of Abū Ma'shar's defense of astrology is not confined to one section but is spread throughout the defense as a whole. This part involves his views on determinism and how the stars have power but do not always circumvent man's free will, as well as the role of

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<sup>91</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1281-1283.

<sup>92</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1300-1320.

<sup>93</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1300-1301.



choice and causation. The debate about free will and fate was ongoing in the first few centuries after the rise of Islam because of the implications for what power belonged to God and whether fate could circumvent God's power over human beings. Except for a few references, Abū Ma'shar does not engage in this debate. In fact, he seems to avoid the debate altogether. At the end of part three, Abū Ma'shar makes one reference to God as Aristotle's Prime Mover.

And the sphere is eternal in motion; the power of the thing which sets it in motion is without end. And if its power is without end, it cannot be a body, however it needs to be a mover of bodies and because its power is limitless. It is not, then, transitory and is not corruptible. See how we reached the creative mover of the things which are known and movable and perceptible by the senses, and it is eternal, having limitless power, and it is not generated and not corrupted: the Blessed and Sublime.<sup>94</sup>

Then, in part four, there are two short statements with the implication that the power the planets have to affect the world comes from God. The first, that "it becomes clear now that God, the Creator, gave signs and natural motions to the planets" and the second, "what the power of the movements of the planets show from what the Creator makes for them from the motions...."<sup>95</sup> Beyond these statements, Abū Ma'shar confines his religious references to the repeated phrase "by the will of God," e.g. at I.419, 510, 889. This phrase occurs thirteen times in Book I, generally after a statement about the power of the movements of the planets. Beyond this occasional caveat, Abū Ma'shar does not get into the religious implications of his chosen art, choosing instead to leave the religious debate out of his defense of astrology and avoid the extra issues that would likely arise from its inclusion.<sup>96</sup> Saliba interprets this lack of engagement with

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<sup>94</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.513-517.

<sup>95</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.542-543, 612-613.

<sup>96</sup>The religious debates surrounding the issue of fate and free will and determinism involved numerous factions and continued until the mid-tenth century when the accepted doctrines for the Sunni and Shi'a sects were generally settled. There are many works dealing with this issue. For a look at the general structure of the religious debates see Ess, Josef van. 2002. *Les prémices de la théologie musulmane*, esp. Chapters 3 and 5. Watt, W. Montgomery. 1985.

the religious leaders as likely being due to Abū Ma'shar feeling he had “made his peace with the religious scholars” by saying that the planets themselves did the will of God.<sup>97</sup>

Instead of focusing on the religious implications of his defense, Abū Ma'shar lays out his reasons for writing his extensive defense of astrology in the first section of Book I in which he describes the structure of *Kitāb al-Madkhal al-kabīr*. The six sections of Book I are about the

existence of the judgments and their corroboration with the power of the movements of the planets and the quality of their influence on this earth and the reply to those who assert the rejection (of the judgments) through evidence and sufficient proofs and the use

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*Islamic Philosophy and Theology*, a general introduction to the various groups and the issues arising among them. Winter, Tim (ed.). 2008. *The Cambridge Companion to Classical Islamic Theology*, esp. Part I: Historical Perspectives. For more on the specific issues of free will, predestination and determinism, see, e.g. Burrell, David B. 1993. *Freedom and Creation in Three Traditions*. This book contains a comparison of various perceptions of God among Jewish, Christian and Islamic theology. For discussions of human freedom and causation, specifically, see Chapter 6: Creatures Acting in a Created World and Chapter 7: On the Relations between the Two Actors. Ess, Josef van. 1991-1995. *Theologie und Gesellschaft im 2. und 3. Jahrhundert Hidschra: Eine Geschichte des religiösen Denkens im frühen Islam*, 6 vols. This work is in a class by itself in terms of the depth into which van Ess goes in his examination of early Islamic theology. The volumes contain extensive discussions of the various sects involved in the religious debates, particularly the Qadariyya, the Mu'tazila and the Ash'ariyya. However, for a specific discussion on the issues of predestination and free will, see Band IV, D1 Problemgeschichtliche Zusammenfassung, 1.3 Namen und Attribute, especially pp. 435-439 and D2 Das Menschenbild, 2.1 Das Handeln, pp. 482-512. Frank, Richard M. 2005. *Early Islamic Theology: The Mu'tazilites and al-Ash'arī*, esp. Chapter III “Several Fundamental Assumptions of the Baṣra School of the Mu'tazila,” Chapter IV “Al-Ma'dūm wal-Mawjūd: the Non-Existent, the Existent, and the Possible in the Teaching of Abū Hāshim and his Followers,” and Chapter VII “The Structure of Created Causality According to al-Ash'arī.” Kenny, Joseph. 2003. *Philosophy of the Muslim World: Authors and Principal Themes*, an introductory text on the issues. See specifically Chapter 3: Secondary causality or determinism. Marmura, Michael E. 2005. *Probing in Islamic Philosophy: Studies in the Philosophies of Ibn Sīnā, al-Ghazālī and Other Major Muslim Thinkers*, esp. “Al-Kindī's Discussion of Divine Existence and Oneness” (with John M. Rist), “Divine Omniscience and Future Contingents in Alfarabi and Avicenna” and “A Medieval Islamic Argument for the Intrinsic Value of the Moral Act.” Watt, W. Montgomery. 1948. *Free Will and Predestination in Early Islam*. Watt, W. Montgomery. 1973. *The Formative Period of Islamic Thought*. For information specifically about the issue of determinism, see Chapter 4: God's Determination of Events, pp. 82-116.

<sup>97</sup>Saliba. 2002, pp. 30-31.

of foreknowledge of events from the science of the stars.<sup>98</sup>

Not only is he describing the methods by which the planets affect the earth, but also the reasons why one should believe in astrology at all. The idea of proving the existence of determinism or even of explicitly defining his stance on determinism is not mentioned. However, the degree to which the stars determine one's fate and the degree to which mankind has free will is an issue which arises repeatedly throughout Book I. Abū Ma'shar's desire may not be specifically about justifying astrology and the place of determinism within it, but because of the Greco-Roman foundations of astrology and the philosophical foundation of determinism, it is hardly a subject he could avoid. Although, as mentioned above, Abū Ma'shar does not engage with the religious debate itself, his location within the Islamic milieu and the intricacies of free will in the context of God's power further complicate the issue of determinism, if only in terms of how his readers would accept or reject his justification. The numerous alternatives to the simple determinism of someone like Manilius do not come up as possibilities for Abū Ma'shar. His solution to the problem of free will, while very different from that of Ptolemy, does not make use of the concept of multiple causes nor of the concept of accidents. Piecing together Abū Ma'shar's views on determinism and astrology requires looking at the various elements to which he alludes throughout his defense.

Returning briefly to Abū Ma'shar's definition of astrology, it is clear that astronomy and astrology are similar in that they both track the movements of the planets, but there is an additional requirement for astrology, i.e. that the effects of the movements of planets be known. The science of the judgments includes "what is generated and takes place *from the power of their*

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<sup>98</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.71-73.

*different movements and their natures*”<sup>99</sup> and how power affects the sublunar realm. The common reference to the obvious effect the movement of the heavens has on seasons, on plants, on temperature are all present in this defense, but in reality, even Abū Ma’shar differentiates between that kind of celestial influence and the kind which is found in astrology proper. In introducing the subject, he describes the argument as one based on analogy (*qiyās*), one that has been used by numerous astrologers before him and even by his mentor al-Kindī.<sup>100</sup> These changes in seasons and weather are obvious to the public as examples of how the heavens affect the earth, but these things can be seen in general observations and do not require the technical ability found in the practicing astrologer. They are only one facet in an art which Abū Ma’shar places above all others. Doctors use the art of the stars as an aid in their practice, but it is the astrologers who “draw conclusions from what exists and what happens in this world by the motions of the planets and their effect on these natures and their changes or mutations.”<sup>101</sup> It is in this section that Abū Ma’shar explicitly states his views on the planets and their power over the sublunar realm: “The planets, by their motions, are a cause for how the natures change, and the natures are changed by the movements of the planets.”<sup>102</sup> The planets are not merely signs of future events, they are causes of those events.

While the planets are often described as merely showing (*dalāla*) the coming events, the sentence above is repeated throughout Book I. In part four, following from his explanations of how the planets are able to affect the sublunar realm in part three, Abū Ma’shar gives

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<sup>99</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.123-124.

<sup>100</sup>Burnett. 2002, pp. 201-202.

<sup>101</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.293-294.

<sup>102</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.295-296.

considerable space to discussing what properties are innate to terrestrial objects and what properties are not. In conjunction with that discussion, he brings out an important aspect of characteristics which leads into his explanation of the possible in part five. The innate characteristics of an object, be it living or not, cannot be changed once given. A man is not going to change into a fish. A man lives, has reason and will die. Those things cannot be changed. That form is permanent once given. However, there are characteristics which do change such as health and sickness, size and shape, temperature, etc.<sup>103</sup> The planets have power and influence over all these things from the initial form to all the impermanent characteristics which can and do change during the life of that man. The planets work together in causing the formation of the various parts and also work in tandem to cause variations within each human being.<sup>104</sup> This power is elaborated in section five. When discussing the method by which the stars make changes on the earth, Abū Ma'shar states, unequivocally, that "the planets, then, are the cause of the motions of these elements and their changes into each other" through the will of God. They are causes of changes in the four elements and thus are causes of changes in man as well. God made the world and the stars and planets as well and so He made the causes of change on the earth, i.e. the planets.<sup>105</sup> The relationship between the planets and the sublunar realm becomes even more explicit as the comparison between astrology and medicine continues. The astrologer, through his investigation of the planets, can predict periods of health and sickness in people and periods of good or evil. The power of astrology does not end there. According to Abū Ma'shar, the movements of the planets affect "the bodies, minds, character, morals and the rest of the parts" of

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<sup>103</sup> Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.586-600.

<sup>104</sup> Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.601-657.

<sup>105</sup> Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.699-713.

a human being. The different powers, different risings and settings of the planets and the stars, they all combine to affect the traits of individuals.<sup>106</sup> This is why it is such a high and noble art, indeed, why Abū Maʿshar calls it the noblest of the arts. By studying the perfect, celestial realm, the astrologer can gain foreknowledge of events on the earth.<sup>107</sup>

One interesting facet of Book I of *Kitāb al-Madkhal al-kabīr* is that the common word for fate, *qadar*, is not used. The idea of foreknowledge is expressed by the Arabic phrase *taqaddumat al-maʿrifa* but in spite of the elements of determinism in this book, Abū Maʿshar does not use the words which would evoke an unmistakable sense of predetermination. It is possible that this is a deliberate avoidance of vocabulary which could be religiously inflammatory. If the story related by Ibn al-Nadīm is correct, then Abū Maʿshar would be aware of which words to avoid and which words would be better to use. In addition, this foreknowledge is the same ascribed to those who work in farming, husbandry, navigation, medicine, etc., and yet, it is also a different type of knowing, and it seems impossible that Abū Maʿshar could think that it is exactly the same. There is another possibility, however, and this is the intriguing idea proposed by Adamson: Abū Maʿshar's astrology *is* deterministic, but he saw no conflict between

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<sup>106</sup> Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.326-334.

<sup>107</sup> Interestingly, the nobility of the art does not preclude it from being corrupted by men, nor from inaccuracies creeping in. As mentioned above, like Ptolemy before him, Abū Maʿshar does not present a science free from error. Astrology, like medicine, like navigation, like most arts, can be done inaccurately, even by those trained in the practice. This idea of the perfection of the art itself vs. the imperfection of the men who practice bears an interesting similarity to the perfection of the heavens vs. the changeability and imperfection of the earth. Astrology should not be blamed and rejected for the errors made by those who study it, just as medicine should not be rejected because doctors make errors. However, even this flaw is made into a strength because Abū Maʿshar explains that, even with these errors, astrology is better than the other arts because people stand to gain much more from accurate predictions and lose less from inaccurate ones. See Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.377-398. See below.

determinism and free will.<sup>108</sup> If this is true, and Adamson makes a good case for it, Abū Maʿshar's defense of astrology takes a definite turn away from Ptolemy's strategy of defense. He does not need to incorporate other causes to account for free will, for accidents, for good and evil. Free will still exists even if the stars do cause events on earth. This seems to be a contradiction in terms but does not appear to be for Abū Maʿshar. In looking through the various defenses he uses in section five and section six in Book I, it becomes clear that the idea of determinism is most definitely present in Abū Maʿshar's astrology as is the idea of choice. Indeed, to Abū Maʿshar, astrology predicts what is *possible* as opposed to what is *necessary* or *impossible*.<sup>109</sup>

This approach requires a philosophical proof that the possible even exists, and the discussion is found within Abū Maʿshar's response to the third group of who would reject the validity of astrology, "some of those who engage in rational enquiry and disputation,"<sup>110</sup> those who would reject it based on the argument that "the stars do not show the possible (*al-mumkin*)."<sup>111</sup> The attention given to this problem is lengthy (a full 150 lines in Lemay's edition) because there are many among those who believe in and practice astrology who are incapable of answering the accusation. Thus, Abū Maʿshar wishes to give them the foundation from which they may argue successfully against their detractors. The argument is steeped in the philosophy of

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<sup>108</sup>Adamson. 2002, p. 247, especially 253ff.

<sup>109</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.725-872.

<sup>110</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.725. Adamson indicates that the phrase more than likely refers to the *mutakallimūn*, possibly the Muʿtazila, who use rational arguments in the service of theology. See Adamson. 2002, p. 262. Burnett points out that Lemay's choice of manuscript reading, "people of speech and the theoreticians," is found only in one manuscript while the majority have this alternate reading. See Burnett. 2002, p. 207, n. 22.

<sup>111</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.727.

Aristotle<sup>112</sup> and is an argument that is mainly centered on interpretations of Aristotle's works. The idea presented by this group of critics is that the stars only show the necessary and the impossible and cannot show the possible and thus astrology is false. Going even further, Abū Ma'shar presents the view of those whom he calls *al-mutafalsifīn al-awwalīn*, the ancient philosophasters, who try to argue that the possible does not even exist, i.e. that things are either necessary or impossible. This is demonstrated, the philosophasters say, by the example of two men speaking of the weather. One says that it will rain tomorrow and the other says it will not rain. One of those states will be true and one will be false. There is no possibility of some intermediate state. This group would say that whatever happens must happen and whatever does *not* happen could not have happened.

And they say that people are forced to their actions by the events; if they do a thing, they do it because they are compelled to do it and it is necessary; and if they do not do it, they refrain from doing it because it is impossible that they do it – everything which is, is necessary and that which is not, is impossible that it be and the stars show only the two and there is definitely no possible.<sup>113</sup>

Essentially, it appears that these false philosophers are arguing for the idea of absolute determinism, i.e. the stars show and cause what will happen in the future with no possibility of changing that future.

Abū Ma'shar, using *al-faylasūf* as his reference, refutes the idea and argues that the possible does indeed exist and has been proven, mostly through human action. The reason for the existence of the possible, and by extension the validity of astrology, is because of the nature of man. Necessity and impossibility are due to nature. It is impossible for fire to be cold or for ice to

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<sup>112</sup> Abū Ma'shar does not refer to Aristotle by name but rather calls him *al-faylasūf*, the philosopher. E.g. see I.729.

<sup>113</sup> Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.746-750.



be hot. The ability to choose, to be rational, creates the possible. However, a human being may make a decision about what he will do, whether good or evil. “If a person says: I was doing good before and I am now doing good, he is not able to say: I, in what comes, will do good with certainty, because he does not know if that is possible or not...”<sup>114</sup> Because men make decisions with regard to planting or building or traveling or making friends, and because men can consult with others and consider the benefits of their decisions, the possible exists.<sup>115</sup> Essentially, for Abū Ma’shar, there is a definite choice for mankind. A man can decide what he wants to do and he may or may not do it. While one might be able to predict certain events which are not the result of the rational mind of man, it is predominantly within the situation of man choosing what to do where the possible exists and where it is most valuable to consult the stars. A human being may make a decision about what he will do, whether good or evil.

Having shown that the possible exists, Abū Ma’shar has to demonstrate that the stars are, in fact, able to show what is possible and not just what is necessary or impossible.<sup>116</sup> Burnett notes that it would have been easier to defend astrology by accepting that the possible does not exist because “one could say that the movements of the stars necessarily caused every change in this world, and nothing was left to chance. Astrology would become an apodeictic science.”<sup>117</sup> However, one of Abū Ma’shar’s intentions is to maintain man’s free will, a position which is shared by this group of astrology’s detractors. Mankind is unique in having free will because he is not made up merely of the four elements (which the planets do affect), nor just the animal soul.

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<sup>114</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.755-766.

<sup>115</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.778-785.

<sup>116</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.816-820.

<sup>117</sup>Burnett. 2002, p. 208.

Human beings are “composed of the animal mind, the rational (mind) and the four elements” and thus, are subject to the power of the movements of the planets on every level, not just the possible, but also the impossible and the necessary.<sup>118</sup> Having proved the existence of the possible and its presence in men, Abū Ma’shar has to demonstrate that the planets will be signs of the possible and not merely the impossible and the necessary. The natural movements of the planets and their own rational souls have an effect on the sublunar world.<sup>119</sup> They do this because of the presence of the four elements and because the planets “signify the arrangement of the animal soul and the rational soul and the body,” causing the things which are necessary, not allowing the things which are impossible and presenting the choices involved in the possible. All possibilities come from the movements of the planets, and then the rational man chooses through the energy of his rational soul.<sup>120</sup> In terms of the possible, the impossible and necessity, astrology’s main use is in illuminating the possibilities. The astrologer is not asked to look at the things which are definitely impossible or necessary. He does not examine the movements in the heavens to discover whether fire is hot or cold, or whether snow is hot or cold. Rather, “he examines whether the fire will burn a body tomorrow...or not” and whether or not it will snow.<sup>121</sup> Through his investigation, he determines which of the possibilities will occur, and thus, he

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<sup>118</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.832.

<sup>119</sup>Abū Ma’shar presents Aristotle’s (“the philosopher’s”) contention that the celestial bodies are living and have rational souls, but he seems skeptical of that idea, writing, “as for the planets, if they have rational minds, they are not in need of them because of their distance from problems.” *Kitāb al-Madkhal al-kabīr*, I.871-872. The planets, being above the sphere of the moon, are simple bodies which move in predictable patterns. They do not face the kinds of decisions required for rational souls in the sublunar world. Human beings have to make choices in order to avoid difficulties. The planets do not. Thus, even if they do have rational souls, even if they are living, they do not function as human beings do.

<sup>120</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.836-843.

<sup>121</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.846-847.

determines which possibilities will become impossible and which will become necessary, i.e. through the choice he has made, a man shifts the possible to the impossible or necessary because in making his choice, he is changing it from a possibility to an absolute. The movements of the planets show only what is possible and through their influence on the rational soul, the animal soul and the elements, they are the causes of all that occurs.

The power of the planets influences all these parts of a human being. That it is a genuine power exerted over the sublunar realm can be seen in the way in which Abū Ma'shar believes that possibility is presented. A person "does not choose except from what the planets show because his choice for something or its opposite comes from the rational mind [which] is mixed with the animal mind." Thus, "the person does not choose except what the planets show from the necessary or the impossible."<sup>122</sup> Abū Ma'shar's fascinating solution to the issue of determinism is that the person may only choose insofar as the choices are presented to him by the stars. Those choices are his because of the rational mind which he possesses, but his choices are restricted, and in certain cases, he does not have a choice at all. He cannot choose outside of the options given to him by the stars.

This idea of whether or not it is possible to change what the stars have shown is one of the areas in which there is a call for questioning Abū Ma'shar's determinism. He plainly believes that human beings can choose within a defined spectrum of choices, but he also believes that there are times when what has been predicted can be changed. If one's future is determined by the movements of the heavens, then how is it possible that the predicted future can be altered?

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<sup>122</sup>Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.860-861, 865-866. In his 2002 article, Adamson notes that the ideas presented in this passage are so obviously deterministic that a medieval scribe wrote "*Cave, hic sermo durus est.*" (Beware, this discourse is hard.) beside those lines. See p. 264, fn. 37.

For Abū Ma'shar, this is not a problem. In describing the types of adversity which the stars predict, he explains that there are five types.

The first is the adversity which, if the man knows it, he may or may not be able to avoid it and it is general. The second is the adversity which, if he knows in advance, he will be able to avoid it completely. The third is the adversity which, if he knows in advance, he will be able to avoid some of it through his foreknowledge. The fourth is the adversity which he knows by his foreknowledge that he will suffer and then it will leave him after a known time. And the fifth is the adversity which, if he knows in advance, he will definitely not be able to avoid it.<sup>123</sup>

This type of presentation could, on the surface, indicate a type of astrology that is simply *showing* what will happen not *causing* the coming events. Taken by itself, there is nothing causative or deterministic in this section. It is simply a list of the different types of predictions astrology offers. However, taken in context with the previous sections, it is an indication of how Abū Ma'shar sees no conflict between free will and determinism. Some things which are determined by the stars can be changed; some cannot. All this refers to the difference between those things which are possible and those which are impossible or necessary. Abū Ma'shar's arguments in section five, coupled with his elaborations and frequent mentions of the powers of the planets over the sublunar realm, demonstrate the compatibility of free will and determinism in Abū Ma'shar's perception. It is possible to see these various arguments simply as inconsistencies in the defense of astrology, but the amount of detail Abū Ma'shar presents within Book I not only in discussing the existence of the possible but also in his extensive analogies with the other arts, the attention to detail, all combine to show a point of view which is not inconsistent but is a medieval example of compatibilism, the idea that free will and determinism are not mutually-

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<sup>123</sup> Abū Ma'shar. *Kitāb al-Madkhal al-kabīr*, I.1180-1186.

exclusive principles.<sup>124</sup> While this concept is never explicitly stated within the text, Abū Maʿshar's methods of defending astrology and his declaration that a man can choose but only what the stars themselves allow him to choose demonstrates a compatibilistic stance when it comes to determinism.

### **Conclusion of Abū Maʿshar's Defense of Astrology**

Abū Maʿshar's closing arguments are a review of previous points he has made. People always use foreknowledge gained from experience. Like doctors who practice medicine, astrologers study the stars in order to know what is coming with the intent of helping their clients. However, astrology is better than medicine because

doctors infer things from the nature of the seasons, changes from state to state and from ephemeral and tangible things. As for the astrologers, they make inferences about living beings from the celestial bodies and from what happens to the seasons and the natures due to the power of these motions. The astrologers also infer from what was in ancient times while the doctor infers what is in one season of the year or in one hour of the day. He rarely can know what has passed.<sup>125</sup>

Being able to predict from celestial objects which are perfect and unchanging results in better knowledge than that garnered from the sublunar realm. Abū Maʿshar's intent is to present a science which is perfectly adapted for the use of mankind. The men who practice it are not all perfect at it and the results do not always result in the possibility of change, but astrology speaks to the rational mind, that part of the soul of man which separates it from animals. He concludes his defense of astrology saying

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<sup>124</sup>Here I am following Adamson (2002), p. 265ff., against Lemay (1962) who argues that Abū Maʿshar's astrology cannot allow for choice or free will. The debate regarding compatibilism continues to the present day, but whether or not a modern analysis allows for the compatibility of determinism and free will, it seems clear here that Abū Maʿshar saw no difficulty in the mutual existence of these two concepts.

<sup>125</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.1338-1343.

that the soul (*al-nafs*) is the best thing in man and it is happy with the knowledge of things that are and that were, but it is not as happy with all arts of knowledge or the knowledge of things past and present as it is with the art of the stars; the art of the stars, since it is better and foreknowledge of existing things comes from it, it is more beneficial than all the arts.<sup>126</sup>

Astrology is the greatest of all the arts because of its subject matter and its ability to give foreknowledge makes it the most valuable for human beings to possess.

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<sup>126</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr* I.1344-1347.

## **Chapter 5**

### **The European Tradition**

#### **5.1 Astrology in the Roman Empire**

The practice of astrology in medieval Europe began with the same foundations as that of the Islamic world, but it took a very different turn, mostly in terms of the sources available to continue a tradition of stellar prediction. Where the astrologers in Islam had access to the works of technical astrologers such as Ptolemy and Vettius Valens and a continuing pattern of transmission of technical knowledge in the major periods of translation in the eighth and ninth centuries, access to the technical treatises and the technical details of actually practicing astrology were lost to a large degree in late Antiquity and the early Middle Ages. What brought about the loss of the works of Ptolemy and Vettius Valens, the training in the practice of astrology which later flourished in the Islamic world (in spite of varying degrees of opposition)? A number of problems can be found within the history of Rome herself and the western Roman Empire at large. These problems, ranging from the public and official perception of the status of astrologers to the decline and eventual “fall” of the western Roman Empire, led to a decrease in the number of people who either knew the art of technical astrology or else were willing to speak of it openly.<sup>1</sup>

There was a decline in the number of people who could read Greek, the language of the intellectual in the Roman Empire, but in addition to this loss of ability, there was a shift in how astrology was viewed. This was not an abrupt shift, nor one that can be blamed on any single event, but it was a genuine shift and largely began after the fall of the Roman Republic and the

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<sup>1</sup>This does not mean that there were no practicing astrologers. The loss of the written sources in the western Roman empire removed access to the technical treatises but not to those people who were already trained in the practice itself.

establishment of the empire. The outward expression of the official perception of astrology and those who practiced it can be seen in a series of expulsions of astrologers from Rome and occasionally from the surrounding areas. Only one such expulsion occurred during the Roman Republic,<sup>2</sup> but from its fall to the reign of Marcus Aurelius in A.D. 180, upwards of thirteen times, the astrologers were forced to leave Rome.<sup>3</sup> That astrology held some degree of prominence in Rome can be seen in the fact that there were enough practicing astrologers in the city to warrant a general expulsion as well as the status achieved by a few families of astrologers who became advisors to the emperor. Cramer notes that these expulsions were not intended to rid Rome of the practice of astrology completely, nor to be a permanent situation. Rather, they were temporary emergency measures meant to prevent activities considered dangerous in a specific time, such as in the time preceding the enthronement of a new emperor.<sup>4</sup> In general, astrology's veracity was much less questioned during the time of the Roman Empire than in the Middle Ages. Certainly, some scholars such as the Skeptic Sextus Empiricus wholeheartedly rejected the validity of astrology, but as they accepted the religious beliefs of many of the groups they conquered, so also did the Romans accept the different styles of divination also practiced by the inhabitants of other regions. Their acceptance also stems from their agricultural foundations and the astrometeorology which was no doubt a part of their own history as it was in ancient Greece.<sup>5</sup>

Astrology gained a foothold in the Roman mindset during the Republic when Greek

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<sup>2</sup>Bouche-Leclercq. 1899, pp. 546-547. This is not an indication of more people accepting astrology during this time period but rather of its relative infancy in the culture. However, by the end of the Republic, astrology was at a high point in the level of acceptance.

<sup>3</sup>Cramer. 1951, pp. 9-10.

<sup>4</sup>Cramer. 1951, pp. 10-11.

<sup>5</sup>On the early role of Roman divination see, e.g., Barton. 1994, pp. 33ff.



philosophy was transmitted into the intellectual milieu of the Roman aristocracy. Both Cramer and Barton point to the acceptance of Stoicism as one of the factors leading to the rise of astrology. Stoicism, while giving divination a prominent place, does not require astrology and it was, in Barton's words, "at most a subordinate feature of Stoic interest in divination,"<sup>6</sup> but this does not preclude astrology riding on the wave of Stoic philosophy as it became popular in Rome. The eclectic nature of the Greek philosophical tenets favored by the Roman elite means that few were converted to one philosophical school but used pieces from many different schools. This diffusion of philosophical ideas, along with their own history of astrometeorology and divination, allowed astrology and the Stoic concept of cosmic sympathy (later incorporated by Ptolemy into his philosophical foundations) to take root within the intellectual milieu of Rome.<sup>7</sup> Not all members of the elite were enamored of this science. Cicero's emphatic rejection of astrology in *De divinatione* and *De fato* demonstrates the fact that this idea of the stars dictating our futures was an idea which was abhorrent to some, although even close friends of Cicero were known for their astrological practices.<sup>8</sup> By the time the Republic fell, astrology was prominent in Roman society, although, as in the Greek world and as it would be in the Christian and Islamic worlds after, it had its share of critics.

Before the rise of Christianity and the rejection of astrology, one of the reasons for official condemnation of astrology, or at least temporary expulsions of those who *practiced* astrology, was because of the way astrological predictions and interpretations could be used. The famous comet which appeared in the sky at the death of Caesar was interpreted officially by

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<sup>6</sup>Barton. 1994, pp. 37-38.

<sup>7</sup>Cramer. 1954, p. 58 and Barton. 1994, p. 38.

<sup>8</sup>One such example is that of Nigidius Figulus whom Lucan portrays prophesying the beginning of a new era with Caesar's crossing of the Rubicon. See Lucan, *Civil War* 1.639-672.

soothsayers, but was also used by astrologers to signal the beginning of a new age for Rome.<sup>9</sup> In 33 B.C. Agrippa issued one of the expulsions in the form of an ordinance which affected only the city of Rome.<sup>10</sup> This was more of a political move than an attack on the practice of astrology, since both Agrippa and Octavian believed in astrology's veracity. The decree was issued and never renewed, likely expiring at the end of the year. In trying to cultivate the Roman populace onto his side in the civil war against Marc Antony, Octavian knew he had to contend against Mark Antony's popularity in the Greek east, and many of the astrologers at this time were not native Roman citizens. By expelling the astrologers who likely supported Mark Antony, Octavian was removing the possibility of astrologers using their art in support of his opponent.<sup>11</sup>

Astrologers' influence in Roman empire peaked with the rule of Vespasian and his sons, Titus and Domitian in the first century B.C.<sup>12</sup> Although astrology itself was largely accepted to a degree, imperial support for its practice waned. Decrees expelling astrologers from Rome or from all of Italy declined as well. Only one expulsion is recorded and that during the reign of Marcus Aurelius, again in a failed attempt to reduce local unrest. Cramer points out that at no time during these bans was astrology itself suppressed. It was the practitioners who could manipulate the craft. However, it is also important to note that these expulsions could only apply to noncitizens and the astrologers constituted a largely foreign element in Rome and Italy during this time. Thrasyllus, astrologer to Tiberius, was not a Roman citizen even with his high position in the imperial court. Some of the records of expulsions justify driving the astrologers out of Rome by

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<sup>9</sup>Bouche-Leclercq. 1899, pp. 548-549.

<sup>10</sup>Cramer. 1951, p. 20.

<sup>11</sup>Cramer. 1951, pp. 18-21.

<sup>12</sup>For examples of the influence astrology, see Suetonius/Rolfe (trans.) 1914. *Titus* 9.2 and Cramer. 1954, pp. 141-142.

speaking of astrology as “ingenious fraud,”<sup>13</sup> something to be avoided in general. Others make it clear that it is the practitioners themselves who pose the danger.<sup>14</sup> The perception is that astrological predictions pose a danger to the imperial court and to the stability of the government as a whole. When citizenship became universal in A.D. 212, mass evictions of astrologers were no longer feasible, but it was only a matter of time before the practice itself was targeted. Diocletian took the first steps, as Cramer notes, long before Christian fanaticism would make it illegal. At the end of the third century, he issued an empire-wide ban of astrology, one which was not made permanent until the end of the fourth century when the Christianizing of the Roman empire began, particularly under the reign of Constantine I. Firmicus Maternus, a practicing astrologer gave warnings to those who would continue the practice, that they should be careful about how they spoke and to whom and where.

See that you give your responses publicly in a clear voice, so that nothing may be asked of you which is not allowed either to ask or to answer. Beware of replying to anyone asking about the condition of the Republic or the life of the Roman Emperor. ...it is a wicked man and one worthy of all punishment who, when asked, gives a response about the destiny of the Emperor, because the astrologer is able neither to find out nor to say anything.<sup>15</sup>

His caution was well-founded. The law against predicting the death of the emperor had initially been a way of eliminating a rallying date for rebellion, but the tide seemed to be turning against the practice of astrology as a whole. Firmicus Maternus’ advice about how an astrologer should live demonstrates a need to avoid even an appearance of any activity which could be turned

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<sup>13</sup>Ulpian. *De officio proconsulis*, VII, in Leg. Mos. Et Rom. Collatio 15.21. Quoted in Cramer. 1951, p. 23.

<sup>14</sup>Suetonius. *Vitellius* 14. Quoted in Cramer. 1951, p. 37.

<sup>15</sup>Firmicus Maternus/Bram (trans.). *Mathesis* II.30.3-4. Although Firmicus believes that the stars govern earthly events (e.g. see II.30.2), he gets around the dangers inherent in predicting the life of the emperor by saying that the emperor is exempt from the dictates of the heavens.

against the astrologer and his art. He advises his friend Mavortius to “have a wife, a home, many sincere friends” and to avoid being “present at nocturnal sacrifices, whether they are held publicly or privately” as well as avoiding giving any forecast in secret.<sup>16</sup> By doing these things and others, Firmicus Maternus says that he will avoid “any suspicion of crime.”<sup>17</sup>

## 5.2 The Christianized Empire

Despite the continued popularity of astrology, it was becoming more dangerous to practice it with the increasing pressure from both religious *and* political authorities regarding its status. Christianity had become the official religion of the empire under Theodosius I at the end of the fourth century, and by the time Theodosius II was the emperor of the Byzantine Empire in the fifth century, there had been numerous laws passed against the practice of astrology, and astrology itself became increasingly linked to magic and various heresies. This link can be seen in the *Theodosian Code*, a codex of the laws made from the time of Constantine I (early fourth century) to the present, compiled by Theodosius II in A.D. 438. In the extensive section on laws for dealing with heretics, astrologers were listed along with Manichaeans, heretics, schismatics, and “every sect inimical to the Catholics” as a group which should be banished from the city of Rome because of the possibility of contamination “by the contagious presence of criminals.”<sup>18</sup>

The growing animosity toward the practice of astrology can be seen in an edict passed by Constantine. Not even people of high rank are to be exempt from punishment should they be caught practicing the forbidden arts.

If any wizard, therefore, or person imbued with magical contamination who is called by

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<sup>16</sup>Firmicus Maternus/Bram (trans.). *Mathesis* II.30.8, 10.

<sup>17</sup>Firmicus Maternus/Bram (trans.). *Mathesis* II.30.15

<sup>18</sup>Pharr (trans.). *Theodosian Code* 16.5.62. For other attacks on astrologers see 9.16.1, 4, 8, 12 and *Sirmodian Constitutions* 6.

the custom of the people a magician, a soothsayer, a diviner, or at any rate an augur, or even an astrologer, or one who conceals some art of divination by interpreting dreams, or at any rate, one who practices *any similar art*, should be apprehended in My retinue or in that of the Caesar, he shall not escape punishment and torture by the protection of his high rank.<sup>19</sup>

Where the emperors of previous years had employed an astrologer as a member of the court, Constantine portrayed astrology as a part of the magical arts and something to be soundly condemned no matter the rank of those practicing it, even if they were part of his own retinue.

A few religious condemnations of astrology survive from late Antiquity, one of the more enduring being that of Augustine of Hippo.<sup>20</sup> In a letter written to Januarius (ca. 400), he takes a firm stand on the possibility of the stars to dictate free will, to determine the course of a human life. While it is allowable to use the stars to predict the weather, “we do not forecast the outcome of our acts, then, by the sun or the moon, or by yearly or monthly periods, lest we be shipwrecked in the most dangerous storms of human life, cast by our free will onto rocks of a wretched slavery.”<sup>21</sup> He makes a clear distinction between the astrometeorology which was common in the ancient Greco-Roman world (something acceptable) and the belief that the stars could force the actions of human beings (an unacceptable belief). Augustine’s views on fate and free will are even clearer in Book V of *City of God*. He begins with a discourse on fate itself, contradicting those who would try to speak of fate in *any* context.

For when men hear that word [fate], according to the ordinary use of the language, they simply understand by it *the virtue of that particular position of the stars which may exist at the time when any one is born or conceived*, which some separate altogether from the will of God, while others affirm that this also is dependent on that will. *But those who are*

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<sup>19</sup>*Theodosian Code* 9.16.6.

<sup>20</sup>Another exceptionally-popular diatribe against astrology from late Antiquity is the *Recognitions* and *Homilies* of Pseudo-Clementine. The author’s arguments follow much the same lines as Augustine but with fewer caveats. See Flint. 1991, pp. 46, 96-97.

<sup>21</sup>As quoted in Flint. 1991, p. 96.

*of opinion that, apart from the will of God, the stars determine what we shall do, or what good things we shall possess, or what evils we shall suffer, must be refused a hearing by all, not only by those who hold the true religion, but by those who wish to be the worshippers of any gods whatsoever, even false gods. For what does this opinion really amount to but this, that no god whatever is to be worshipped or prayed to?*<sup>22</sup>

It is interesting to note that to some degree, during Augustine's time, fate was bound up with the practice of astrology, the assumption being that one cannot believe in astrology without also believing in fate. The belief that the stars dictate the future of a human being leads away from the worship of *any* deity, not only the Christian God. However, in the context of Christianity, the issue according to Augustine is that, if the stars dictate the fates of mankind, even at the behest of God Himself, there can be no judgment for righteous or wicked deeds.<sup>23</sup> Even if the stars merely signify rather than cause an evil deed, this prediction is false and leads one into error because of the many weaknesses of astrology.<sup>24</sup> While he makes an effort to lay out some arguments against it as earlier critics did, his focus is on the preservation of free will, something he asserts that astrology cannot give.

The establishment of Christianity as the state religion of the Roman Empire, both in Rome and in Constantinople galvanized the official condemnation of astrology, changing it from a political move to one ostensibly meant to save the citizens from eternal damnation. It is important to remember, however, that astrology as a practice continued throughout the whole empire whether officially or unofficially. The fact that the emperors felt it necessary to issue decrees and to enforce said decrees and that prominent Christians such as Augustine published diatribes against astrology indicates its continuing presence. Flint rightly points out that the

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<sup>22</sup>Augustine of Hippo/Dods (trans.). *City of God*, V.1.

<sup>23</sup>Augustine of Hippo/Dods (trans.). *City of God*, V.1.

<sup>24</sup>For Augustine's technical understanding of astrology, see Hegedus. 2007, pp. 59-61.

textual evidence, particularly in the western empire after the fall of Rome, does not tell the whole story.<sup>25</sup> There are many hints of the survival of astrology in some form and its role as “a weapon in a battle both for devotion and authority” during the early Middle Ages.<sup>26</sup> Even within Christianity one can find a range of views on astrology’s place and on the degree of its acceptance or rejection.

### **5.3 Learning in the Latin Middle Ages: The Encyclopedic Tradition**

Due to the general decay of the western Roman empire and the subsequent decline in the number of people who spoke and read Greek, the surviving scientific treatises were only those which had been translated into Latin. Greek was the language of science and the educated elite, but the decline of the western empire limited the study of Greek. From widespread famines to barbarian invasions and plagues, the people of the western empire were more concerned with survival than with the complex workings of science. Where the devotion to gaining scientific knowledge created a situation in which many texts were translated from Greek into Arabic during the eighth and ninth centuries in the Islamic world, in Latin Europe, the skill for reading Greek was more or less lost, and with it numerous technical treatises were lost as well. The early Middle Ages was the receiver of a long period of decline of interest in technical scientific treatises, one which can be traced back to a time of greatest prosperity for the Roman empire. A general decline in scholarship had begun in spite of the continuation of the great academic schools in Athens, Rhodes and Alexandria. An increased emphasis was placed on the study of rhetoric and, by the second century, a recognition of the evident poverty of Greece and its

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<sup>25</sup>See Flint. 1990, pp. 1-27.

<sup>26</sup>Flint. 1990, p. 23.

inferiority to Rome.<sup>27</sup> In education, the emphasis had shifted to philosophical ideas and creating good leaders rather than good scientists. Science was still a part of education but it was simplified.<sup>28</sup> Rather than devote time to translating various works directly into Latin, Roman scholars from late Antiquity epitomized Greek science, i.e. they distilled Greek science down to definitions and chose to eliminate the proofs of that science in favor of saving only the most basic parts.<sup>29</sup> In addition, Latin lacked a pre-existing technical terminology, requiring many Greek scientific terms to be transliterated. This imperfect assimilation became ever more imperfect as the ability to read Greek became more rare. Access to the technical treatises waned and all that remained was the encyclopedic tradition.<sup>30</sup>

What survived so far as the practice of astronomy and astrology is concerned is the encyclopedic tradition such as is found in the works of Pliny the Elder and in late Antiquity and the early Middle Ages, those of Isidore of Seville, Macrobius, Calcidius and Martianus Capella. The compiled works such as those of these authors are all that preserved and informed the Latin West's store of knowledge for the first few centuries of the Middle Ages beyond the oral tradition which did exist to some degree.<sup>31</sup> Knowledge of the works of Ptolemy, Plato and Aristotle, assumed to be vital in the formation of medieval natural philosophy was lacking, in spite of frequent references to them. For example, the encyclopedic authors attributed many ideas to Plato which were discovered centuries after his life. Most claims by encyclopedic authors of

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<sup>27</sup>Reynolds and Wilson. 1991, pp. 44-48.

<sup>28</sup>McCluskey. 1998, p. 117.

<sup>29</sup>Stahl. 1991, p. 4.

<sup>30</sup>McCluskey. 1998, p. 116.

<sup>31</sup>See Flint. 1991, pp. 92-101.



familiarity with Ptolemy's works are nothing more than false attributions based on paraphrases or small excerpts.<sup>32</sup> While a detailed investigation of these works falls outside the purview of this discussion, a cursory glance at some representative texts from this time period will demonstrate their importance to the perception and place of astrology in the early Middle Ages.

To understand the state of the sciences in general and astrology in particular during the Middle Ages, it is necessary to give a brief glimpse into medieval education, which has its roots in the works Martianus Capella's *De nuptiis Philologiae et Mercurii* and his description of the seven subjects of the *trivium* and *quadrivium*. The text takes the form of an elaborate allegory in which Philologia, the anthropomorphization of wisdom, is taken up to heaven to marry Mercury, in the Middle Ages the god of eloquence. The seven liberal arts making up the trivium and quadrivium are guests at the wedding.<sup>33</sup> Martianus was not a scientist. He was a commentator and gatherer of pre-existing information, a pagan living in the Roman empire during the fifth century. His work has been not much studied in modern times because of the difficulty of comprehending Martianus' Latin and, possibly more importantly, because of the fact that Martianus does not seem to understand some of the subjects he relates. In his book on astronomy, for example, Martianus, in describing the eight latitudes, places Meroë at the summer tropic, in contrast to the other handbook authors who place Syene in the summer tropic.<sup>34</sup> The trivium and quadrivium as presented in Martianus' text, however, became one of the most important sources for the structure of medieval education for eight centuries after its composition.<sup>35</sup> Carolingian scholars in

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<sup>32</sup>Stahl. 1959, pp. 95-96.

<sup>33</sup>Stahl. 1965, pp. 103-104.

<sup>34</sup>Martianus Capella/Stahl (trans.). *De nuptiis Philologiae et Mercurii* 8.876.

<sup>35</sup>Levine. 1966, p. 216.

the eighth and ninth centuries viewed *De nuptiis* as a work which was useful as a handbook of science and of Latin. Nearly fifty manuscripts survive from the ninth century alone, many of which have been annotated, demonstrating a detailed engagement with the information presented.<sup>36</sup>

Macrobius, a near contemporary of Martianus Capella, has two surviving works which exerted a similar influence: the *Saturnalia* and *Commentary on the Dream of Scipio*. Like Martianus, Macrobius is not a scientist but a compiler of information. The commentary on Cicero's *Somnium Scipionis* was a more technical work than Martianus' *De Nuptiis* and its astronomical parts actually were circulated independent of the larger commentary;<sup>37</sup> however, the focus was not on creating a coherent astronomical system but rather expounding on the merits of Neoplatonism.<sup>38</sup> Within the text, Macrobius addresses not only common astronomical issues but also engages with the ongoing discussion about the nature of the heavens and their influence on the terrestrial realm. Like Augustine and Sextus Empiricus, he identifies the sun and moon as sources of celestial influence, although his description seems to go further than influence on weather and seasons.

The sun and moon, it is true, are the principal guardians of our lives. Of the two faculties identified with terrestrial bodies, sense-perception and growth, the first comes to us from the sun, the second from the moon. Thus we are dependent upon these two planets for the life we enjoy.<sup>39</sup>

In addition, the other five planets, although dependent upon the sun and moon, are not entirely separate because of their harmony with the luminaries. Referencing Ptolemy's *Harmonics*,

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<sup>36</sup>Teeuwen. 2003, pp. 185-187.

<sup>37</sup>McCluskey. 1998, pp. 117-118.

<sup>38</sup>Stahl. 1952, pp. 9-12.

<sup>39</sup>Macrobius/Stahl (trans.). *In Somnium Scipionis*, 1.19.23.

Macrobius describes this harmony as a series of numerical relationships “among all things that may properly be associated with each other” without which there could be no coordination among the celestial bodies.<sup>40</sup> The ratios between the various planets and the sun and moon are what create the labels of beneficent or maleficent. Jupiter and Venus are beneficent because of their harmony and aspect with the sun and moon, while Saturn and Mars have no such numerical harmony and are thus maleficent. As Stahl explains in the introduction to his translation, while Macrobius’ text trends toward a different goal perhaps than other encyclopedists of Late Antiquity and the Middle Ages and demonstrates great organizational skills, he is still a compiler, presenting few original doctrines.<sup>41</sup> Like Martianus Capella’s *De Nuptiis*, the commentary seems to have been extremely popular during the Middle Ages with nearly fifty manuscripts surviving along with numerous references in other texts.

The foregoing texts focused more on astronomy proper rather than astrology, and one issue which arises in the survival of astrology from Antiquity to the Middle Ages, be it technical or otherwise, is how some of the more important elements of Greco-Roman astrology were practiced. While Martianus Capella gives basic foundations of astronomy with varying degrees of accuracy, his work does not delve into astrology with the exception of a few lines at the end of his book on astronomy in which he describes the exaltations and aspects of the various planets, and interestingly, the effects of the sun’s rays on the motions of the planets.<sup>42</sup> Without the astronomical and astrological treatises which made the transition to the Islamic world via the

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<sup>40</sup>Macrobius/Stahl (trans.). *In Somnium Scipionis*, 1.19.21, 22.

<sup>41</sup>Stahl. 1952, p. 23. The exact sources of Macrobius’ information are unknown although he makes citations to Plato, Ptolemy and Plotinus among others. It seems less likely that he had genuine access to the works of these ancient scholars.

<sup>42</sup>Martianus Capella/Stahl (trans.). *De nuptiis Philologiae et Mercurii* 8.880-887.

state-sponsored translation movement, how could the medieval European astrologers know how to go about plotting planetary movements with any degree of the accuracy required for a genuine horoscope to be cast or for the catarchic casting to be done correctly? In terms of plotting planetary positions in order to make correct calculations, an astrologer would normally need to make use of planetary tables. It does not appear that any of these tables made the transition to the Latin world of medieval Europe. David Juste notes one possible exception in the *Preceptum Canonis Ptolomei*. This text was composed in Rome during the sixth century and was a translation from Greek of the *Handy Tables*, along with instructions which came from Theon's *Little Commentary*.<sup>43</sup> At the least it was known to Cassiodorus, a Roman statesman,<sup>44</sup> and seems to be the only treatise from the early Middle Ages which contains real astronomical calculations.<sup>45</sup> The difficulties in assuming the availability and influence of this text are due to the nature of the translation which is extremely literal to the point that parts would be unintelligible, its poor state of preservation and the fact that no references are made to it after the time of Cassiodorus until the eleventh century in a manuscript copy.<sup>46</sup> Pingree describes the translation as a “weird and motiveless alternation of Latin and Greek” that must have seemed “very learned nonsense” to those who were unfamiliar with the language.<sup>47</sup> This does not mean that plotting planetary longitudes was impossible, however. There is ample evidence of other methods. Some of these come from the encyclopedic literature, others from the *computus*

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<sup>43</sup>Pingree. 1990, p. 365.

<sup>44</sup>Juste. 2004, pp. 181-182.

<sup>45</sup>McCluskey. 1998, p. 117.

<sup>46</sup>Juste. 2004, pp. 181-182. The earliest surviving manuscript of the text dates to approximately 1000, Harley 2506 in the British Library. Pingree. 1990, p. 367.

<sup>47</sup>Pingree. 1990, p. 366.

tradition, i.e. the methods used to compute the date of Easter. In addition, there is a source of practical celestial observation found in the highly-regulated world of medieval monasteries where daily rituals, both day and night, were regulated by the movements of the heavenly bodies.<sup>48</sup>

In terms of the general perceptions of astronomy and astrology, as opposed to the actual practice, one of the more influential works is the *Etymologies* of Isidore of Seville. While Boethius exerted a large influence, the *Etymologies* mostly superseded the *Consolation of Philosophy* following its publication; however, both works continued to loom large in the minds of scholars who came after. Even Bede used their teachings in his creation of the festal calendar.<sup>49</sup> Isidore was the archbishop of Seville in sixth and seventh century Spain, living under the rule of the Visigoths during a time of considerable upheaval. No fewer than ten different kings ruled in Spain during Isidore's lifetime. The Byzantines had invaded Spain shortly before Isidore's birth and were driven out approximately ten years before his death. Not much is known of his life although he seems to have had some connection with the ruling monarchy, Sisebut in particular, to whom he dedicated his *De Natura Rerum* in 613. According to Barney, et al., Isidore was admired for his ability to read both Greek and Hebrew but "his knowledge of these languages appears to have extended only to disconnected Greek terms and phrases, and a smattering of Hebrew words."<sup>50</sup> Even so, the admiration for his intelligence and eloquence was not misplaced. Many of his other works are extant, but it is his *Etymologies* which would become extremely popular in the years following its publication, even in its unfinished state. The

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<sup>48</sup>McCluskey. 1998, pp. 97-104.

<sup>49</sup>Von Stuckrad. 2008, p. 49.

<sup>50</sup>Barney, et al. 2006, p. 7.

*Etymologies* is a work which Henderson compares to *Roget's Thesaurus*, i.e. as a “monumental word-store” containing, not just Isidore’s interpretation of the origins of words but the “bastardization of a determined attempt to systematize a forceful ideology.”<sup>51</sup> It is only through an understanding of this mindset that one can truly understand and appreciate the *Etymologies* and what Isidore was trying to accomplish.

Within the *Etymologies* Isidore covers topics ranging from grammar to medicine to religion to architecture. Although he does not spend a great deal of time on astrology, what space he does devote to that topic is important if only because of the influence this text had on medieval education. In his section on astronomy, Isidore specifically separates what he calls *astronomia* versus what he calls *astrologia*. As was mentioned in chapter one, the difference between the two terms was not specified in Antiquity and this division was an attempt to separate the two sciences. Astronomy (*astronomia*) is “the law of the stars, which, by investigative reasoning, touches on the courses of the constellations, and the figures and positions of the stars relative to each other and to the earth.”<sup>52</sup> Astrology (*astrologia*), in contrast, has two parts.

It is natural as long as it investigates the courses of the sun and the moon, or the specific positions of the stars according to the seasons; but it is a superstitious belief that the astrologers (*mathematicus*) follow when they practice augury by the stars, or when they associate the twelve signs of the zodiac with specific parts of the soul or body, or when they attempt to predict the nativities and characters of people by the motion of the stars.<sup>53</sup>

As Augustine did before him, as well as Sextus Empiricus, Isidore allows for a kind of astrology which associates the movements of the heavens with the seasons. Anything related to human beings, to casting horoscopes, however, is to be avoided. In fact, he spends the majority of the

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<sup>51</sup>Henderson. 2007, p. 5.

<sup>52</sup>Isidore of Seville/Barney, et al. (trans.). *Etymologies* III.xxiv.

<sup>53</sup>Isidore of Seville/Barney, et al. (trans.). *Etymologies* III.xxvii.2.

chapter only on different elements of astronomy. It is only at the end, in the section on the names of the various stars that Isidore returns to the concept of astrology. After reviewing the myths associated with the stars, he illustrates Henderson's claim of presenting an ideology, not just an etymology. His position as a Christian, and as an archbishop, is clear. "But whatever the type of superstition with which they have been named by men, the stars are nevertheless things that God created at the beginning of the world, and he set them in order that they might define the seasons by their particular motions."<sup>54</sup> Again, as it has with many other polemics against astrology, the problem of fate and free will arises. Brief as his explication of astrology might be, Isidore is no different from his predecessors in rejecting astrology particularly on the issue of fate. Studying the stars to know one's fate is detrimental to the Christian soul. Not only is it detrimental, it is not a valid method of learning the future. Only those who have been "enticed by the beauty and clarity of the constellations" become blinded by the idea "so that they attempt to be able to foretell the results of things by means of harmful computations, which is called 'astrology' (*mathesis*)."<sup>55</sup> The issue at hand is that of fate and punishment for sin or reward for good. How can a human being be punished or rewarded for behavior if that behavior was fated to happen by the stars?

In spite of Isidore's general condemnation of anything which could be "contrary to our faith," as he saw astrology,<sup>56</sup> Flint sees in his very condemnation the elements that would later allow astrology to become defensible from a Christian point of view in that he explicitly stated that a *part* of astrology is valid, i.e. the "natural" astrology devoted to investigating the courses of

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<sup>54</sup>Isidore of Seville/Barney, et al. (trans.). *Etymologies* III.lxxi.37.

<sup>55</sup>Isidore of Seville/Barney, et al. (trans.). *Etymologies* III.lxxi.39.

<sup>56</sup>Isidore of Seville/Barney, et al. (trans.). *Etymologies* III.lxxi.38.

the stars and their effects on the seasons.<sup>57</sup> As Carey notes, however, even this method of passing on the knowledge of astrology, in addition to the oral tradition presented by Flint and the *computus* tradition shown by Juste and McCluskey, could not create the technical astrological practice seen in Antiquity and in medieval Islam. That required astronomical tables, instruments and knowledge about both their construction and their use.<sup>58</sup> While it is clear that the Middle Ages were not so devoid of technical astronomy as has been assumed in the past, it is equally clear that the rise of technical astrology in the later Middle Ages required not only interest and a degree of respectability supplied by the medieval Church, but also access to technical treatises which were lacking during the Middle Ages. That the treatises were sought is support for Flint's proposed influence from the Christian Church, particularly that the partial rehabilitation of astrology created the fertile ground for its rise at the end of the Middle Ages,<sup>59</sup> but the influence which came from the Islamic world during the translation period in the twelfth and thirteenth centuries galvanized the practice of astrology and transmitted the familiar elements formulated in Antiquity.

#### 5.4 Arabic-Latin Translation Movement

In order to understand the status and practice of astrology in the later Middle Ages, some time must be spent on the translation movement which reached its height in the twelfth and

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<sup>57</sup>Isidore of Seville/Barney, et al. (trans.). *Etymologies* III.xxvii.1-2. See also Flint. 1991, pp. 98-99.

<sup>58</sup>Carey. 1992, pp. 25-28.

<sup>59</sup>Flint. 1991, pp. 141-145.



thirteenth centuries, particularly those who translated in Toledo and in Sicily.<sup>60</sup> As with the early Greek-Arabic translation movement in the eighth century, much of the work done occurred on the borders, places where different cultures and, more importantly, different languages intermingled. Toledo was conquered by Alfonso VI of Castile in 1085 and Sicily fell to the Normans in 1091, meaning that these former Arabic centers, with their large stores of scientific texts, fell into the hands of the Christian conquerors. Almost as important as the texts themselves, Christian Spain had a large population of Arabic speakers. These people, called Mozarabs, were Christian by belief but Arabic with respect to language and culture and served as cultural and linguistic intermediaries between the Spanish Christians and the Arabic knowledge now available to them. Al-Andalus had been an important center of interaction among the various faiths and cultures since the eighth century when the Muslims first conquered it. As the Christians slowly reconquered the Iberian Peninsula over the next 700 years, there were many links formed, particularly during the periods of peace when commercial ties were strong. These interactions can be seen even before the twelfth century with the training and travel of many European scholars (often members of the clergy) to al-Andalus as diplomats or ambassadors. One of the more famous examples is that of Gerbert of Aurillac in the tenth century who studied mathematics for three years in Catalonia. How much direct contact he had with Arabic learning is not known for certain, but it seems clear that he did learn Arabic during his years of study and was possibly responsible for the dissemination of early Arabic-Latin translations of scientific

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<sup>60</sup>This section will focus mainly on the translation movement in medieval Spain because, as Lindberg notes, in general, the larger program existed in Toledo while Sicily became much more important for the translation of texts directly from Greek into Latin. See Lindberg. 1978, pp. 58-59.

texts.<sup>61</sup>

The real high point of the Arabic-Latin translation movement, however, came in the twelfth century, beginning with the work of Adelard of Bath, one of the few early twelfth-century translators who did *not* work from Spain. His work was important because it marks the first translation of a number of Greek and Arabic texts, including Abū Ma'shar's *Shorter Introduction to Astrology*, as well as al-Majritī's revision of al-Khwarizmī's *Astronomical Tables*. Most of the major translators during this period were based in Toledo, in large part because of the library which preserved many of the scientific texts. These texts formed the basis of the translations, but they should not be confused with the state-sponsored translations undertaken in ninth-century Baghdad which were better-organized and, at least initially, were of much higher quality.<sup>62</sup> There was no school of translators, in spite of the popularity of the city. Its position as a center of culture for Jewish, Muslim and Christian scholars is what made the work possible. However, translations were done on an individual basis although many scholars came with the intention of translating a particular text at the instigation or with the support of a wealthy patron. Some came without any knowledge of Arabic at all and learned it in order to translate.<sup>63</sup> The general process of translations as done in Spain was that of word-for-word correspondence which was presented as the ideal, taking their cue from Boethius who insisted that "the translator must render his text word for word and sacrifice elegance for fidelity."<sup>64</sup> One of the Mozarab translators, John of Seville, in commenting on his work, wrote that he could not always present a literal translation

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<sup>61</sup>Lindberg. 1978, pp. 59-61.

<sup>62</sup>Hourani. 1972, p. 102.

<sup>63</sup>Lindberg. 1978, pp. 63-64.

<sup>64</sup>Lindberg. 1978, p. 78.

but that “his goal is to do so, so that he does not depart too far from the truth,” a sentiment which became widespread among the religious intellectuals.<sup>65</sup>

One of the most famous of the Toledan translators is Gerard of Cremona whose stated purpose for going to Toledo was to make a translation of Ptolemy’s *Almagest* from Arabic into Latin. The eulogy written by his disciples illustrates his desire to make the ancient Greek and medieval Arabic texts available to Latin Europe. “...he went to Toledo; there, seeing the abundance of books in Arabic on every subject, and regretting the poverty of the Latins in these things, he learned the Arabic language, in order to be able to translate.”<sup>66</sup> To that end, Gerard translated over seventy treatises, including Ptolemy’s *Almagest*. His output was not limited to Greek scientific and philosophical treatises. He also translated al-Khwārizmī’s *Algebra*, al-Kindī’s *De aspectibus* as well as works by al-Fārābī and alchemical texts by al-Rāzī.<sup>67</sup> Following the trends of the translation movement in Toledo, Gerard tended toward literal word-for-word translations. The value of his work has recently come into question in that some of his translations are so literal that he has transliterated Arabic words for which he could find no equivalent in Latin, making the meaning of the text almost impossible to discern without the aid of a commentary. Weber argues, against Lemay, that this belief that a literal *ad verbum* translation would automatically be more accurate than an *ad sensum* translation led to a text which was “so rough that it was not really useful to anyone else without interpretation.”<sup>68</sup> No

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<sup>65</sup>Weber. 2002, p. 125.

<sup>66</sup>Quoted in Lindberg. 1978, p. 65.

<sup>67</sup>Lindberg. 1978, p. 66.

<sup>68</sup>Weber. 2002, p. 126. Weber also argues that many of Gerard’s problems when translating came from his partial acculturation, and thus incomplete understanding of the Arabic/Islamic milieu.

matter the level of difficulty found in using Gerard's translations, it is clear that his works were vital for the spread of Greek and Arabic texts throughout Europe, even if, as Weber suggests, the *culture* of the Islamic world did not interest him.<sup>69</sup> The Arabic-Latin translation movement presented plenty of difficulties for its participants, beyond that of making an accurate translation. Gerard is an example of one who does not seem to have wanted any cultural influence from the Islamic world while still desiring to gain access to the scientific knowledge available only to those who could read Arabic. It was, in fact, a "clash between two worlds, both embodying universal claims to political and ideological dominance" which enabled this movement to take place.<sup>70</sup>

One of the important facets of the translation movement in the twelfth and thirteenth centuries is the subjects which received the most attention initially. Science and philosophy were the first areas from which texts were taken, and, more importantly, the practical sciences were chosen over the more esoteric sciences. Medical and astrological texts were more popular than other subjects both in Christian Spain and in Sicily and southern Italy. Although they were also available, most of the native Arabic creative literature, both prose and poetry, were either ignored or rejected outright.<sup>71</sup> Even so, the Arabic scientific texts were not avoided, and astrology, for all the uncertainty of its place within both Christian and Islamic milieux, rose in prominence. Al-Andalus, because of the continual shifts in rulers and cultures over the centuries, had been a rich ground for astrological discussion and debate. As Islam and Christianity ebbed and flowed in power and influence, there were periods of open discussion and interaction among Christians,

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<sup>69</sup>Weber. 2002, p. 133.

<sup>70</sup>Abattouy, Renn and Weinig. 2001, p. 6.

<sup>71</sup>Hourani. 1972, pp. 105-106.

Muslims and Jews.

As a result of these times of scholarly interactions, many astrological texts were available for translation, among them Abū Ma'shar's *Great Introduction to Astrology* which was translated into Latin twice during the twelfth century, once by John of Seville in 1133 and again by Hermann of Carinthia in 1140.<sup>72</sup> Both John of Seville and Hugh of Santalla translated texts by Masha'allah. Adelard of Bath translated Abū Ma'shar's *Abbreviated Introduction to Astrology* before the translation of the longer work. In addition, as mentioned in chapter 2, Ptolemy's *Tetrabiblos* was translated from Arabic, under the title of *Quadripartitum*, by Plato of Tivoli in 1138, again in 1206, and twice more before the 1256 translation by Aegidius de Thebaldis. These duplicate translations possibly were due to the disjointed nature of the translation effort. Many of the early translations were duplicated over a very short time, either because of ignorance about the existence of other translations or because the existing translation was considered mediocre. A Latin translation directly from the Greek text was not made until after the first printed text was available in 1535.<sup>73</sup> Both the Greek text and a Latin translation were made available by Joachim Camerarius in the sixteenth century.

The effects of the availability of these texts on intellectual European thought is traditionally seen as widespread. Mathematical, astronomical, astrological and philosophical texts were incorporated into the curricula of the medieval universities at Paris, Oxford and in Italy. Throughout the twelfth and thirteenth centuries, these texts became more and more prevalent and seem to have contributed directly to the rise of scholarship in the later Middle Ages. However, it is difficult, if not impossible, to determine how much is due exclusively to the

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<sup>72</sup>Von Stuckrad. 2008, pp. 43, 46.

<sup>73</sup>Carmody. 1955, pp. 18-19.

Greek texts and how much to the original Arabic treatises. Even while some translators actively avoided the Arabic and Islamic culture in their translations, they could not help but be influenced by the methods found in the Arabic scientific texts. Before the gradual pull back from non-Christian learning which began at the end of the thirteenth century, the popularity of Arabic scholarship was such that the Islamic scholars were cited in original Latin texts. Famous Islamic philosophers such as Ibn Sīnā and Ibn Rushd, better known by their Latinized names Avicenna and Averroes, were popular for their commentaries on Aristotle and for their philosophical debates.<sup>74</sup> Aristotelian works caused some debate in and of themselves in that they tended to contradict some Christian doctrines, e.g. the eternity of world.

### **5.5 Europe in the High Middle Ages**

Europe in the thirteenth century reaped the rewards of the ongoing translation movement. Texts translated in Spain and Italy were copied and recopied and then spread throughout Europe. The High Middle Ages had seen a series of marked changes from the previous era which affected the dissemination and acceptance of these new texts. The division between the Roman Catholic Church and the Eastern Orthodox Church became official as a result of the East-West Schism of 1054. Better living conditions brought about a dramatic increase in the population of Europe, leading to the founding of new colonies in Eastern Europe and the changing of boundaries between France and Germany, remnants of the earlier Carolingian Empire. In addition, the Holy Roman Empire reached its height of power and geographical influence during the twelfth century under the reign of Frederick II but also began its steady decline in authority due to his granting of former imperial *regalia*, or rights, to the ruling princes, particularly in Germany. While the translation period in Spain and southern Italy brought about a desire for texts both from Antiquity

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<sup>74</sup>Hourani. 1972, pp. 106-107.

and from the medieval Islamic world, this same time period also marks the beginning of the Crusades which would continue until the end of the thirteenth century with the loss of Acre to the Mamluks in 1291. Within the purview of the Roman Catholic Church, the High Middle Ages is the era of the height of monasticism as well as the founding of the Mendicant orders throughout the thirteenth century. Of great importance for the next chapter, St. Francis Assisi founded the Franciscan order in 1209 which was subsequently recognized with its official Rule in 1223. The Mendicants were groups of traveling friars who were tasked with combatting heresy, the Cathars in particular, and keeping the European Christians on the true path. With the increase in population and the corresponding increase in the number of people living in cities came the idea that city-living bred heresy because of the relative freedom denied those who were of a lower class in the feudal system.<sup>75</sup> In contrast to the monastic orders, the friars lived in the world, moving from town to town, fighting for the Catholic Church in its battle against internal dissent.

During this time of political and religious upheaval, education was also going through a number of changes. Early medieval education was centered mainly in the church in the monastic and, later, the cathedral schools. The liberal arts were often taught along with basic reading and writing skills, but the focus was on religious education, understanding the Bible, its literal and spiritual meaning. While the monastic schools made only occasional use of the natural sciences, the cathedral schools, often based in the cities, had a “broader conception of the range of subjects that were religiously useful” as the so-called “handmaidens of religion and theology.”<sup>76</sup> With the re-introduction of ancient Greek learning and the addition of the works from the Islamic world,

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<sup>75</sup>French and Cunningham. 1996, pp. 41-42.

<sup>76</sup>Lindberg. 2003, pp. 19-21.

the liberal arts became more popular among scholars.<sup>77</sup> The translation movement was, in a sense, galvanized by, and in turn supported, the shifting focus of education. Medieval scholars were looking for texts relating to the seven liberal arts and thus were interested in texts from the Greco-Roman world *and* from the Islamic world. By the end of the twelfth century, a new type of institution arose in response to this wave of knowledge: the *studium* or the university. The university in Paris was founded in the 1190s, Oxford by 1200 and Cambridge in 1209.<sup>78</sup> The exact steps leading from the cathedral schools to the universities are unclear due to a lack of surviving evidence, but as the population increased and the number of students in elementary education grew, it became necessary to have more teachers in higher education. Out of this rise in demand, the teachers and students organized themselves into a guild, a *universitas*. This gradually led to both external and internal organizations which protected the rights and privileges of the teachers and allowed them control of what they taught, how they taught it and what they charged for instruction.<sup>79</sup>

The curriculum taught at these new universities also shifted away from the general liberal arts education which had been typical of the earlier educational institutions. Although retaining elements of the earlier framework, the trivium and quadrivium were modified to accommodate the new texts spreading throughout the continent. Logic rose in prominence while Grammar faded. Mathematical subjects continued at a lower level of importance while moral philosophy, natural philosophy and metaphysics replaced other subjects. Access to Aristotelian texts can be seen in Paris and Oxford as early as the first decade of the thirteenth century and shifted

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<sup>77</sup>French and Cunningham. 1996, p. 56.

<sup>78</sup>French and Cunningham. 1996, pp. 61-63.

<sup>79</sup>Lindberg. 2007, pp. 218-219.



education to the natural philosophy as presented by Aristotle. The arts faculty came to be so dominated by the various philosophies that it was known the faculty of Philosophy. Mastery of the Aristotelian subjects was considered vital to advancement to higher studies.<sup>80</sup> Astronomy was taught, using the newly translated Greek and Arabic texts, but mostly as an aid in timekeeping, or as the foundation of astrology. Advanced degrees were granted in medicine, which often included the study of astrology, law and theology.<sup>81</sup>

As popular as the Aristotelian corpus proved to be, it was not universally accepted. Throughout the thirteenth century, condemnations were issued by various clergy, particularly in Paris, often directed at the University of Paris and its curriculum. In 1210, the provincial synod of Sens stated that “Neither the books of Aristotle on natural philosophy nor their commentaries are to be read at Paris in public or secret, and this we forbid under penalty of excommunication.”<sup>82</sup> This was a local prohibition only, rather than all across Europe. In addition, it seems to have been applied to the faculty at the University of Paris only. According to Grant, the effects of this condemnation were not long-lasting and scholars continued to study the newly-available texts in Paris, including Aristotle’s works.<sup>83</sup> Further orders and condemnations against the new natural philosophy followed in 1231, 1255, 1272 and mostly famously in 1277 with the condemnation issued by Stephen Étienne Tempier, the Bishop of Paris and Chancellor of the University of Paris, which contained over 200 articles of doctrines which were to be rejected on threat of excommunication. Many of these articles were against Aristotelian doctrines such as the

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<sup>80</sup>French and Cunningham. 1996, p. 64.

<sup>81</sup>Lindberg. 2007, pp. 223, 226-228.

<sup>82</sup>Thorndike (trans.). *Chartularium Universitatis Parisiensis*. Repr. in Grant. 1974, p. 42.

<sup>83</sup>Grant. 1974, p. 42, n. 3.

eternity of the world (e.g., art. 87, 98, 99, 107) and also against cosmological and astrological ideas which could contradict Christian doctrine, e.g. the theory that the lives of men are predetermined (art. 21) or that the celestial bodies could influence the lives of men (art. 137, 143, 161, 162). These various prohibitions do not automatically equal a total suppression of Aristotelian philosophy. Their existence does not prove the active rejection of Arabic and Greco-Roman learning. It does, however, demonstrate the ambivalence that appeared almost concurrently with the spread of the translated texts, a sign of the continuing difficulty of some of these doctrines as scholars attempted to assimilate them into European intellectual life.

## 5.6 Astrology in the High Middle Ages

Tester describes the state of astrology before the twelfth century as “nothing more than a faint memory of a lost, and illicit, art flickering in the minds of those with a genuine interest in astronomy.”<sup>84</sup> He acknowledges that there was some access to the Latin astrological tradition via Firmicus Maternus’ *Mathesis*, at least as early as the eleventh century, but how much help it would have been in practicing technical astrology is questionable. There is little evidence for any real popularity of the book before the twelfth century, and in any case, as Tester notes, “nobody could actually have practiced astrology with only the *Mathesis* to hand” and all indications are that, with the lack of astronomical tables and access to the process of creating a horoscopic chart, the influence of Firmicus Maternus was minor.<sup>85</sup> Even so, how faint and flickering that memory was has been brought into question by Flint who argues for a continuing tradition of practical astrology throughout the Middle Ages.<sup>86</sup> In particular, she theorizes that the “rehabilitation” of

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<sup>84</sup>Tester. 1987, p. 129.

<sup>85</sup>Tester. 1987, pp. 131, 141-142.

<sup>86</sup>See Flint. 1990 and 1991.

astrology owes a lot to medieval Christians who grappled with the problems of navigating through the various divinatory practices still so prevalent in Europe in the ninth and tenth centuries. In comparison to the magical tradition, astrology seemed to be a much safer option, and one which resulted in less competition for the priests and clerics.<sup>87</sup> In both cases, however, they agree that the translation of Arabic and Greek astrological texts did much to spur the revival of astrology.

One of the first authors to reference an Arabic astrologer was Alanus de Insulis, a twelfth-century French theologian, who mentioned Abū Ma'shar<sup>88</sup> in his text *Anticlaudianus* saying that "Albumasar consults the stars, poles, heavens and the seven planets."<sup>89</sup> In the same time period, Bernard Silvester also had access to the newly translated works and his *Cosmographia* is, in part, due to the new atmosphere of excitement engendered by the translation movement and the many Arabic texts being translated into Latin, although the extent to which he had direct access to these texts is less certain. He certainly owes some debt to Abū Ma'shar for his conception of the sun's power and physical effects on the earth.<sup>90</sup> In addition, as mentioned above, the translation movement in Spain produced Latin versions of astrological texts from the beginning. John of Seville translated al-Qabīṣī's treatise on judicial astrology early on in the movement and these texts were available in schools outside Spain such as the Chartres school in northern France before the end of the twelfth century.<sup>91</sup> Adelard of Bath, responsible for introducing astronomical

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<sup>87</sup>Flint. 1991, pp. 145-146.

<sup>88</sup>Alanus de Insulis used the Latinized form of Abū Ma'shar's name: Albumasar.

<sup>89</sup>Alanus de Insulis. *Anticlaudianus* 4.1. Latin text quoted in Wedel. 1920, p. 62.

<sup>90</sup>Stock. 1972, p. 24, 184.

<sup>91</sup>Wedel. 1920, pp. 60-61.

tables to western Europe, is also the possible author of a number of horoscopes cast in England about such things as the actions of the various players in the Anarchy in the mid-twelfth century.<sup>92</sup> Not only were these handbooks important for the dissemination of technical astrology, it also broadened the ways in which astrology could be practiced. One of the more popular genres was that of the doctrine of conjunctions. Presented in great detail by Abū Ma'shar in his work *On Great Conjunctions*, historical astrology was based on the premise that conjunctions of the various planets would indicate great events on the earth. The most popular were the Saturn-Jupiter conjunctions which occurred approximately every twenty years. These would be used as heralds of political and religious upheavals, the changing of rulers, the fall of civilizations, the ending of religious power. However, the concept could be extended to any planetary conjunction, and it was. In 1186, there was a conjunction of the five planets in the sign of Libra and the significance and rarity of that conjunction was extended to the possibilities of terrible meteorological upheavals such as violent storms. The appointed day (16 September) arrived accompanied by great panic, but the chronicles do not record any severe weather beyond a local hailstorm.<sup>93</sup>

With the translations of the texts by Abū Ma'shar and Ptolemy in the twelfth century, along with many other astrological texts, there was a new situation in which handbooks on how to practice astrology and information on its foundations were more widely available. In addition, the popularity of Aristotle in the academic world became a support for the study and practice of the science. For example, in his *De generatione et corruptione*, Aristotle describes coming to be and passing away as being a result of circular motion.

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<sup>92</sup>Page. 2002, p. 11.

<sup>93</sup>Page. 2002, p. 12.

The cause of this perpetuity of coming-to-be, as we have often said, is circular motion: for that is the only motion which is continuous. That, too, is why all the other things-the things, I mean, which are reciprocally transformed in virtue of their 'passions' and their 'powers of action' e.g. the 'simple' bodies imitate circular motion.<sup>94</sup>

References to celestial influence on the sublunar realm are also common in the *Meteorologica* and, with the general acceptance of Aristotle, came a need to look at these other elements of astrology, in particular, the traditional view that the stars had an influence, not only on the elements but also on human beings. In order to maintain the increasingly-popular practice of astrology, there was a need to extricate the idea of prediction from the principle of causation, or else to create a situation in which the two ideas could coexist within Christian Europe without removing the principle of free will which was so vital to the Catholic Church. There were few attacks on astrological causation as it applied to meteorology, alchemy and even medicine, but the issue of determinism and fate and free will set up the old debate anew. The fodder for future attacks on astrology was the same as it had been in Greco-Roman Antiquity as well as in the Islamic world: how can one justify the belief in the idea that the stars cause or force human actions, as well as the arguments found in the works of Sextus Empiricus and Cicero.<sup>95</sup> Those who condemned astrology in the twelfth century often did so with the same framework used by John of Salisbury, the Bishop of Chartres (d. 1180) which is similar to that propounded by Isidore of Seville 500 years earlier: “the stars are signs, and signs not only of times but of physical processes and events, such as the weather and sicknesses; anything attributed to the stars which derogated from the omnipotence of God or the freedom of man was superstitious and dangerous.”<sup>96</sup> It was fine to use the stars as predictors of weather, of illness (as found in the

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<sup>94</sup>Aristotle/Joachim (trans.). *De generatione et corruptione*, 2.10.

<sup>95</sup>Smoller. 1994, p. 30.

<sup>96</sup>Tester. 1987, p. 147.

Hippocratic corpus), but suggesting that the stars could possibly have an effect on the behavior of a human being was crossing the line between that which was acceptable and that which was to be condemned. The awareness of astrology's implications can also be seen early in the translation movement in the *De Naturis Rerum* of Alexander Neckham, an English contemporary of Alanus de Insulis. While he acknowledged that "superior bodies have some influence over inferior ones," he was quick to point out that man has free will which is "not impelled by necessity either this way or that."<sup>97</sup> Astrology's tenuous position as something better than pagan magic was lost, leading to its growing reputation in the thirteenth century as "the particular vice of the learned man."<sup>98</sup> Astrology, while increasingly popular, was being presented as a dangerous pastime for the educated. Although Isidore's division of natural vs. superstitious astrology continued, the superstitious side, that which dealt with the actions of mankind, was more vehemently rejected.<sup>99</sup> This meant that those who would defend the practice of astrology needed to find a way to do so without removing all the aspects which made astrology so enticing.

The direct effects of the massive influx of texts may not be certain but it is clear that at least one of the results of the spread of translations was that scholars of all sciences were involved in the necessity of incorporating the new information into university curricula, both in understanding the material and figuring out how to use the new sciences without challenging religious tenets.<sup>100</sup> The spread of technical astrology renewed the debate about its validity as would be seen in the works of both attackers and defenders of astrology in the thirteenth century

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<sup>97</sup>Neckam. *De Naturis Rerum* I.8. Quoted in Wedel. 1920, p.62.

<sup>98</sup>Carey. 1992, p. 32.

<sup>99</sup>Tester. 1987, p. 178.

<sup>100</sup>Lindberg. 2007, pp. 225-226.

and later.

## Chapter 6

### Roger Bacon's Defense of Astrology

In this new arena of Arabic learning and of new discussions concerning the acceptance or rejection of astrology comes Roger Bacon, a Franciscan friar who lived and died in the thirteenth century having studied at the universities in both Oxford and Paris. Historians' opinions on Roger Bacon, who he was, his exact achievements, his lasting importance, have varied widely over time.<sup>1</sup> In the history of astrology, he stands out as one who advised a figure no less powerful than the Pope that astrology should be utilized as a valuable tool by the Roman Catholic Church. While his opinion and exposition of astrology is only a fraction of his work as a whole, and he was hardly the only scholar studying this controversial science, Bacon is an important part of the rationalized astrology because he created an interesting defense of astrology which reflects many of the same aspects of the defenses of Ptolemy and Abū Ma'shar. This can be seen in his views on astrology, the importance he placed on the problem of determinism that so plagued the practice, and his reliance on the newly-translated Arabic texts. Thus, Bacon's *Opus maius*, with its extensive defense of the practice of astrology and his attempts to justify his interest in the science, continues the evolution of Ptolemy's rational astrology, this time in a Christian context.

#### 6.1 Life

As is typical of scholars from this time period, the exact dates of Bacon's birth and death are not certain. The common dates given for his life are 1214-1292. As Clegg has said, the date of 1214 is "no more than a guess, based on surprisingly scant information."<sup>2</sup> The date comes from a statement in Bacon's *Opus tertium*, dated to 1267, that he had lived and studied for forty

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<sup>1</sup>For a good examination of the shifting perceptions of Roger Bacon, see Power. 2006, pp. 657-692.

<sup>2</sup>Clegg. 2003, p. 7.



years since he had first learned the alphabet. From the resulting 1227 date, 1214 comes from the assumption that Bacon meant from the time of his matriculation which typically occurred at age thirteen.<sup>3</sup> Whatever the exact year, Bacon was born in England, possibly near Ilchester. His family were members of the Norman ruling class during the prosperous reign of Henry III. He was sent to Oxford University for his schooling. He received an M.A. and began lecturing at both Oxford and Paris. In addition, he wrote treatises for his students and commentaries on Aristotle's works. The years for his degree and his lectures are unknown beyond that he was definitely in Paris before 1245 because he states that he saw Alexander of Hales who died that year.<sup>4</sup> His lectures in Paris were based on Aristotle's works.<sup>5</sup> It is likely that he returned to Oxford before 1250, although again, this is not certain, and spent time studying theology, possibly under Adam Marsh who lectured at Oxford from 1247-1250.<sup>6</sup> During this same period, Bacon's interest in the sciences was such that he claims to have spent over 2000 pounds for "secret books and various experiments and languages and instruments and tables and other things; as well as for searching out the friendships of the wise, and for instructing assistants in languages, in figures, in numbers, and tables and instruments and many other things"<sup>7</sup> over the course of twenty years although he makes no mention of where he got the large sum of money, which is interesting considering the

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<sup>3</sup>Clegg. 2003, pp. 7-8. Clegg also argues for a birth date of 1220 rather than the traditional 1214, taking Bacon's statement of first learning the alphabet literally which means that he would have been younger than thirteen years in 1227.

<sup>4</sup>Little. 1914, pp. 3-5.

<sup>5</sup>In spite of the earlier prohibitions of Aristotle's works, instructors at the University of Paris continued to study them with varying degrees of secrecy. There is no indication that the early prohibitions did much to eliminate the study of the Aristotelian corpus.

<sup>6</sup>Lindberg. 1983, pp. xvii-xviii.

<sup>7</sup>Bacon. *Opus tertium*, p. 59. Quoted in Crombie and North. 1970, p. 377.

fact that he complained about not having access to adequate funding for his research.

Bacon became a Friar Minor of the Franciscan order around 1257 during a period of upheaval in the order because of disputes over the vow of poverty which had split the spirituals and conventuals within the order. The appointment of Bonaventure as the leader of the Franciscans resolved the issue, but one of the results was the prohibition of friars from publishing any secular books without prior approval of their superiors, and this would have an effect on how Bacon's studies proceeded.<sup>8</sup> Because Bonaventure felt that the subjects which attracted Bacon's interest were not as vital as theology, it seemed unlikely to Bacon that he would be able to get approval for the type of research he wanted to pursue. Thus, he made contact with the Cardinal Guy le Gros de Foulques and proposed education reform and offered to present a comprehensive program to him with his support. The Cardinal became Pope Clement IV in spring of 1265 and renewed contact with Bacon in the form of an official order for him to write about the topic of their previous conversations. However, this did not include any funds for his study, in part because the Pope had assumed the work was already written or at least near completion when in reality it was not even begun.<sup>9</sup> As a result Bacon was forced to borrow money and supplies from friends in order to have access to the materials he required and, due to Bacon's feelings of persecution within the Franciscan order, as well as the fact that it was forbidden to have direct contact with the Pope, it had to be done in secret.<sup>10</sup> The result of the mandate was the *Opus maius*, *Opus minus* and *Opus tertium*, along with the supplements of *De speciebus et virtutibus*

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<sup>8</sup>Hackett. 1997, pp. 16-17.

<sup>9</sup>Bartlett. 2008, p. 114.

<sup>10</sup>Hackett. 1997, pp. 17-18. Bacon claims to have been obstructed and abused by his superiors. There is no evidence that this was a long-term problem, but it did result in his transfer to Paris for "close watching." See also Lindberg. 1983, pp. xxi-xxiii.

*agentium* and *De scientia perspectiva* attached to the *Opus maius*, all written before the death of the Pope in November of 1268 and the subsequent vacancy of the papacy until 1271, which unfortunately led to the loss of any intellectual security Bacon might have gained from the papal court.<sup>11</sup>

Roger Bacon was not one who had a problem with self esteem. Bartlett describes Bacon as “securely elitist” and one who “thinks himself better than most people, although he is usually willing to concede that there might be a couple of scholars whom he might talk to.”<sup>12</sup> This is due to Bacon’s belief, expressed in the *Opus tertium*, in the lack of education of his fellow scholars, going so far as to say that, at most, there are only five other Latin scholars with a good grasp of science. This lack of respect for those around him, coupled with his research into subjects often considered risky, or even heretical, led to his continuing difficulties within the Franciscan order. The traditional story is that at some point, around 1278, he was arrested and kept in prison for years. This assumption is based, in part, on the lack of source material for Roger Bacon’s life or career from 1278 to 1292 when he published the *Compendium studii theologiae*.<sup>13</sup> However, there is some question about the length of the imprisonment or if it even occurred. Lindberg questions the reality of the imprisonment,<sup>14</sup> and Hackett and Williams question whether the imprisonment, if it did happen, was of long duration, preferring the possibility that he was translating and commenting on the pseudo-Aristotelian *Secretum secretorum* at Oxford.<sup>15</sup> Beyond

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<sup>11</sup>Hackett. 1997, pp. 18-19.

<sup>12</sup>Bartlett. 2008, p. 119.

<sup>13</sup>Hackett. 1983, pp. 85-88. For other theories about Bacon’s life from 1278-1292, see Crowley. 1950, pp. 67-69. Also see Clegg. 2003, p. 144.

<sup>14</sup>Lindberg. 1983, p. xxvi.

<sup>15</sup>See Hackett. 1983, p. 85-88 and Hackett. 1997, p. 20; and Williams. 1994, pp. 57-73.

the legends which built up around Bacon and the later chronicles, there is no evidence of an imprisonment of any length, and very little evidence of any action of any kind. Maloney states that it is obvious that something did happen to cut back on his output but presents Easton's suggestion that, if any imprisonment took place, it was "more the person of Bacon that may have been condemned than any of his particular theories" as the more likely explanation than the traditional view of Bacon as the repressed intellectual hero.<sup>16</sup> The next documented appearance of Bacon comes in 1292 with his publication of the *Compendium studii theologiae*. It is also traditionally the year he died.

## 6.2 Thought and Works

In spite of Clegg's grandiose appellation of "The First Scientist," Roger Bacon was not a scientist, a word which is of relatively modern origin and conveys a specific image. There are assumptions and methods which were prevalent during the thirteenth century, a time of great shifts in intellectual activities, which informed Bacon's thought and his works. As a Christian and a friar, Bacon believed in the supremacy of God and in revealed knowledge. He also believed that knowledge could come through study and observation, i.e. that "the human soul is capable of receiving knowledge from this source [God] through its own highest faculty, the *intellectus possibilis*."<sup>17</sup> His work on science itself is not detailed but as Easton says, it is fair to judge Bacon on the basis of "his achievements as a scientific thinker and philosopher."<sup>18</sup>

The perceived value of Roger Bacon's contributions have gone through ebbs and flows over the centuries, but in terms of what he *thought* he was doing with his own works, this is clear

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<sup>16</sup>Maloney. 1988, p. 8.

<sup>17</sup>Easton. 1952, p. 168.

<sup>18</sup>Easton. 1952, p. 168.

from the opening chapters of his *Opus maius*. He begins this large work by stating that “A thorough consideration of knowledge consists of two things, perception of what is necessary to obtain it and then of the method of applying it to all matters that they may be directed by its means in the proper way.”<sup>19</sup> Only a few lines down, he presents to the Pope what his intentions are in writing the *Opus maius*: “Therefore, I shall now try to present to your Holiness the subject of the attainment of this knowledge, not only relatively but absolutely.”<sup>20</sup> What Bacon was proposing was a new method of Christian education, one that would remove the four problems he saw as obstructing knowledge: “submission to faulty and unworthy authority, influence of custom, popular prejudice, and concealment of our own ignorance accompanied by an ostentatious display of our knowledge.”<sup>21</sup> These are issues which afflict every human being and must be overcome in order to truly educate the Christian world. The purpose of this education is not to create an appreciation of the sciences for their own sake but rather to foster a knowledge of theology. In part two of the *Opus maius*, Bacon states that his purpose is to show that

there is one wisdom that is perfect and that this is contained in the Scriptures. From the roots of this wisdom all truth has sprung. I say, therefore, that one science is the mistress of the others, namely, theology, to which the remaining sciences are vitally necessary, and without which it cannot reach its end. The excellence of these sciences theology claims for her own law, whose nod and authority the rest of the sciences obey.<sup>22</sup>

Philosophy and science are important aids to gaining real knowledge, but they are subservient to the ultimate knowledge which is knowledge of the divine, i.e. theology.

The *Opus maius* is not so much a scientific treatise as it is an extended plea for a new

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<sup>19</sup>Bacon/Burke (trans.). *Opus maius*, I.1, p. 3.

<sup>20</sup>Bacon/Burke (trans.). *Opus maius*, I.1, p. 3.

<sup>21</sup>Bacon/Burke (trans.). *Opus maius*, I.1, p. 4.

<sup>22</sup>Bacon/Burke (trans.). *Opus maius*, II.1, p. 36.

method of gaining knowledge. This new method is called *scientia experimentalis* which is usually translated as *experimental science*. The word *experimentalis* can be translated as *experiment*, but is more likely to mean *experience* and the method the *science of experience*, meaning not so much an experiment as anything which has been experienced. It is important to distinguish Bacon's idea of *scientia experimentalis* from laboratory experiments. Bacon accepted the possibility of experiment, but it is not an experiment in the modern sense.<sup>23</sup> In part six of the *Opus maius*, he defines experience in this way:

Experience is two-fold. One kind is gained through our external senses, and in this manner we gain experiences of things in the heavens by means of instruments in astronomy. ...This experience is human and philosophical as far as man can act according to the grace given him.<sup>24</sup>

However, this type of experience is not enough. It does not go far enough in elucidating truth. Thus, another type of experience is needed, that which comes from divine inspiration as can be seen in the fact that "the holy patriarchs and prophets, who first gave the sciences to the world, received illumination within and were not dependent on the sense alone."<sup>25</sup> He is not rejecting either the senses or revelation. Both are necessary for absolute truth. In addition, both require some sort of experience rather than acceptance of previous reports. These elements are not to function independently of one another but should build on each other. "The science of experience verifies all natural and artificial things...not by arguments as the purely speculative sciences do,

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<sup>23</sup>Easton. 1952, p. 7. John of Seville's translation of Abū Ma'shar's *Kitāb al-Madkhal al-kabīr* uses *experimenta* (e.g. 219, 223) for the Arabic word *tajriba* (e.g. 129) meaning "based on experience." Hackett also recommends that *experimentum* should be translated as "personal experience" to avoid confusion. See Hackett. 1997, pp. 293-294, n. 49.

<sup>24</sup>Roger Bacon. *Opus maius*, VI.1. Trans. Hackett, p. 293.

<sup>25</sup>Roger Bacon. *Opus maius*, VI.1. Trans. Hackett. 1997, p. 293.

nor by feeble and imperfect experiences as the operative sciences.”<sup>26</sup> This experience should be applied broadly to all aspects of knowledge, but it is not a rejection of the ancient knowledge. Bacon, like other scholars of the thirteenth century, studied, translated and used the new texts from the Islamic world and the newly-available Greek texts. These are not to be ignored. Rather, they should be earnestly studied and understood and translated into Latin in order to make them available to the European scholars.<sup>27</sup> Experiments are to be done only with the aim of bolstering the cause of philosophy which is framed by a “Christian ethical system.”<sup>28</sup> Fixing education in Europe was not just needed in order to raise up smarter scholars and improve human life. It was also vital to human salvation. All sciences, no matter how important, were subordinate to moral philosophy because morality affects both this life and the life to come. Like the sciences, moral philosophy or moral science has two types: speculative and practical. Both are important and both have an impact on the medieval Christian.<sup>29</sup> This idea of a science based on experience rather than simply on authority was the backbone of Bacon’s unwritten *scriptum principale* which he would have presented to the Pope in place of the *Opus maius* and supplementary works had he had enough time. Where the *scriptum principale* would have been a comprehensive collection of Bacon’s knowledge, the *Opus maius* was, instead, a *persuasio* meant to gain the Pope’s support, both financial and otherwise, for the new Christian education and for a full discussion of all the science available at the time.<sup>30</sup>

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<sup>26</sup>Roger Bacon. *Opus tertium*, p. 46. Quoted in Easton. 1952, p. 176.

<sup>27</sup>Easton. 1952, pp. 177-178.

<sup>28</sup>Easton. 1952, pp. 176-177.

<sup>29</sup>Hackett. 1997, pp. 405-407.

<sup>30</sup>Easton. 1952, pp. 152-153, 160-161.

### 6.3 *Opus maius*

The text of the *Opus maius* has survived only in incomplete form. The most recent Latin edition of the entire surviving text was made in 1897 by John Henry Bridges. It rectified an error found in the first printed Latin edition made by Jebb in 1733 as well as in a corrected edition in 1750. In both editions, Jebb omitted the seventh part on Moral Philosophy. In his preface, Bridges clarifies the importance of the seventh part as being the culmination of the entire work.<sup>31</sup> Even so, the text remains incomplete because the only two manuscripts which contain the seventh part are incomplete, based on Bacon's own summary of the *Opus maius* as found in the *Opus Tertium*, ending just before the conclusion of the fourth division out of six listed, which means that the last two have been lost. Bridges made other major alterations to his edition, removing *De Multiplicatione Specierum* from the text. He also interpolated several pages to the third section from a Cottonian MS, Julius D.v.<sup>32</sup> The 1897 edition of the *Opus maius* is based on the Oxford MS because of its general completeness with the Cottonian MSS, Julius D.v. and Tiberius C.v. as secondary texts.

As mentioned above, the *Opus maius* was written at the behest of Pope Clement IV, along with the *Opus minus* and *Opus tertium*. It is structured as an extended plea or *persuasio* for a change to the methods of education. Roger Bacon felt that the Latins (European Christians) were badly behind the rest of the world in the sciences and mathematics and this was due to their woeful lack of languages.

For it is impossible for the Latins to reach what is necessary in matters divine and human except through the knowledge of other languages, nor will wisdom be perfected for them absolutely... For the whole sacred text has been drawn from the Greek and Hebrew, and

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<sup>31</sup>Bridges. 1897, pp. x-xi.

<sup>32</sup>Bridges. 1897, p. xii.



philosophy has been derived from these sources and from Arabic.<sup>33</sup>

The various parts of the plea deal with all the aspects of what Bacon considers to be the methods by which Christianity will be brought out of the state of ignorance in which Bacon saw it lying.

Part I deals with the causes of error, i.e. all those things that keep human beings from truth and keep them in ignorance. This part also contains Bacon's initial justification for the work and the need for the attention of the Pope, stating that

by the light of knowledge, the Church of God is governed, the commonwealth of the faithful is regulated, the conversion of the unbelievers is secured, and those who persist in their malice can be held in check by the excellence of knowledge, so that they may be driven off from the borders of the Church in a better way than by the shedding of Christian blood.<sup>34</sup>

Without knowledge, the very Church of God will be in danger and the state of Christian knowledge is in such straits that it is need of drastic restructuring. Part II deals, in general, with philosophy and its relation to theology. Bacon's views on the status of religion vs. science can be seen here: "I wish to show in this second part that there is one wisdom that is perfect and that this is contained in the scriptures. From the roots of this wisdom all truth has sprung."<sup>35</sup> All knowledge comes, ultimately, from the same source, if it is true, and the "exposition of divine truth is made through those sciences. For it is itself unfolded as it were in the palm with these sciences, and yet it gathers within its own grasp all wisdom."<sup>36</sup> Throughout this part, Bacon strives to demonstrate the importance of philosophy to theology and to show how these two areas of knowledge are necessary. Even so, he does not advocate philosophy on its own merits, but

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<sup>33</sup>Bacon/Burke (trans.). *Opus maius*, III.1, p. 75.

<sup>34</sup>Bacon/Burke (trans.). *Opus maius*, I.1, p. 3.

<sup>35</sup>Bacon/Burke (trans.). *Opus maius*, II.1, p. 36.

<sup>36</sup>Bacon/Burke (trans.). *Opus maius*, II.1, p. 36.

rather only insofar as it can be reduced to divine truth. Foreign philosophy and knowledge which cannot be so reduced is “essentially harmful and has no value considered by itself. For philosophy in itself leads to the blindness of hell, and therefore it must be by itself darkness and mist.”<sup>37</sup>

The last five books each deal with one aspect of this knowledge: Grammar, Mathematics, Optics, the *scientia experimentalis* and Moral Philosophy. Part III is the language portion, and in it, Bacon makes his case for the need for all learned men to know numerous languages. It is also the beginning of his exposition on those topics which are the most important for the “exposition of this splendid wisdom.”<sup>38</sup> The lackluster state of knowledge among the Latins is due to problems of languages both with regards to an understanding of other languages and to the lack of good translations into Latin. Many of the sciences did not originate in Europe and thus come from other cultures and other languages, specifically Greek, Hebrew and Arabic. Those who have labored to learn other languages have been able to translate, but “since we do not imitate them, we therefore lack a grasp of the sciences to a degree past belief, because we cannot understand their authentic expositions and consequently we are unable to gain an understanding of the sciences.”<sup>39</sup> The Latins have lost access to knowledge available to those who have learned other languages and “of necessity have been forced to bear the loss along with the censure.”<sup>40</sup>

Part IV is the plea for the study of mathematics. If the importance of the various subjects can be partially defined by the amount of space dedicated to them, this section of the *Opus maius*

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<sup>37</sup>Bacon/Burke (trans.). *Opus maius*, II.19, p. 74.

<sup>38</sup>Bacon/Burke (trans.). *Opus maius*, III.1, p. 75.

<sup>39</sup>Bacon/Burke (trans.). *Opus maius*, III.3, p. 82.

<sup>40</sup>Bacon/Burke (trans.). *Opus maius*, III.14, p. 115.

is what Roger Bacon considers the most important, covering more than 300 pages of the translated text. Second would be the topic of moral philosophy which covers almost 200 pages, followed by optics and then *scientia experimentalis* and languages. However, mathematics covers a wide range of topics from actual mathematics and geometry to cosmology, astronomy and astrology to geography and climate. As it is vital for any kind of knowledge to know many languages, so also is mathematics vital for the understanding of the sciences.

Of these sciences the gate and key is mathematics, which the saints discovered at the beginning of the world, as I shall show, and which has always been used by all the saints and sages more than all other sciences. Neglect of this branch now for thirty or forty years has destroyed the whole system of study of the Latins.<sup>41</sup>

The sciences rely on mathematics for proof and verification. In order to demonstrate this, Bacon goes through celestial and terrestrial sciences to show that both require mathematics in order to be properly proven and examined, and the forces and agents are explained using geometry.<sup>42</sup> However, mathematics is not only of value to the sciences. It is important to relate also to sacred subjects, and “we must give this more consideration, because human things have no value unless they be applied to divine things.”<sup>43</sup> In covering this topic, Bacon returns to astronomy and astrology as it relates to theology because the “vastness of things celestial stirs us to reverence the Creator.”<sup>44</sup> It is here also that Bacon makes one of his first references to Abū Maʿshar as one of his sources. Using a Latinized form of his name, Albumazar, he cites his *Kitāb al-Madkhal al-*

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<sup>41</sup>Bacon/Burke (trans.). *Opus maius*, IV.1.1, p. 116.

<sup>42</sup>Bacon/Burke (trans.). *Opus maius*, IV.2.1-3, pp. 128-138.

<sup>43</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 195. It is at this point that the previous divisions and chapters cease. For the remainder of Part IV, the text is continuous without any subheadings. The practice of using chapters and distinctions resumes in Part V.

<sup>44</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 200-201.

*kabīr* as support of the idea that Noah's son Shem knew the art of astronomy.<sup>45</sup> Throughout Book IV, especially in his last section on the uses of astrology, Bacon makes a number of references to earlier authorities, most significantly to Albumazar and Ptolemy, as valuable sources of information for the practice of astrology.<sup>46</sup> Quite a bit of space is devoted to elucidating various principles of astronomy and astrology, and it is clear that Bacon considers these sciences to be important because there are so many tangential applications of it from a reform of the calendar to medicine and geography, as well as the religious applications already mentioned. The last section of Part IV is that which elaborates on the influence of the heavens upon the terrestrial world. This section, along with the earlier sections on astronomy and astrology will receive a more detailed analysis below.

Part V of the *Opus maius* is on the topic of optics and, in the tradition of Ibn al-Haytham (Latin: Alhazen), Roger Bacon pursues an optical science which depends on both physiological and physical explanations. Bacon's reason for dealing with optics as one of the important subjects for a new educational system is that it is "far nobler and more pleasing, since we take especial delight in vision, and light and color have an especial beauty beyond the other things that are brought to our senses," and he cites Aristotle's *Metaphysics* that "vision alone reveals the differences of things; since by means of it we search out experimental knowledge of all things that are in the heavens and in the earth."<sup>47</sup> Understanding vision is important because

in God's Scripture nothing is so much enlarged upon as those things that pertain to the eye and to vision, as is evident to one who reads the Scripture through; therefore, nothing

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<sup>45</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 196. Bacon also referred to Albumazar's explanation of Shem being interested in astronomy in II.9, p. 53.

<sup>46</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 404-405. In addition to Abū Ma'shar and Ptolemy, Bacon also makes reference to Avicenna, Alkabiz and Hali Abenragel.

<sup>47</sup>Bacon/Burke (trans.). *Opus maius*, V.1.1, p. 419.

is more necessary for the natural and spiritual meaning than definite knowledge of this science.<sup>48</sup>

Part VI is the chapter on the *scientia experimentalis* which is vital to incorporate into the new education because “without experience nothing can be sufficiently known.”<sup>49</sup> Things can be known via reason and experience. Reason can lead to a conclusion but it “does not make the conclusion certain, nor does it remove doubt so that the mind may rest on the intuition of truth, unless the mind discovers it by the path of experience.”<sup>50</sup> Both are important, but without experience, reason cannot be certain. In order to demonstrate the usefulness of *scientia experimentalis*, he uses examples of the rainbow, the astrolabe and medicine. There are three prerogatives for the *scientia experimentalis*. The first is to investigate conclusions made by earlier authorities by means of experiments and testing. The second is the creation of new instruments and new data via experience. These include the astrolabe, mirrors and medical cures. The third prerogative is that which leads to future understanding. Here, Bacon again makes reference to the practice astronomy and astrology, but “he seems to think that there is a short cut around the normal practice of Astronomy/Astrology,” i.e. the use of instruments and tables in conjunction with this new method can lead to knowledge of the future.<sup>51</sup> Hackett calls this section the “most unsatisfactory aspect of *Opus maius*, part six” and emphasizes that the section on astrology in part four must be kept in mind when reading this section.<sup>52</sup> The conclusion of Part VI, again, deals with the application to theology. The advantages to using *scientia experimentalis*

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<sup>48</sup>Bacon/Burke (trans.). *Opus maius*, V.3.3, p. 576.

<sup>49</sup>Bacon/Burke (trans.). *Opus maius*, VI.1, p. 583.

<sup>50</sup>Bacon/Burke (trans.). *Opus maius*, VI.1, p. 583.

<sup>51</sup>Hackett. 1997, pp. 295-296.

<sup>52</sup>Hackett. 1997, p. 296.

is such that it is beneficial in “its special knowledge of the future, present and past, and in its display of wonderful works on behalf of Church and state, so that all useful activities are promoted and the opposite are hindered.” In addition, it aids in the conversion of the nonbelievers because it demonstrates undeniable truths to those who are seekers of truth. It also aids in the construction of weapons which can be used against those who do not believe and refuse to believe and against the Antichrist who will come against the Church.<sup>53</sup>

The final part of Roger Bacon’s plea to the Pope is the

moral science and the civil science which instructs man as to his relations to God and to his neighbor and to himself, and proves these relations, and invites us to them and powerfully influences us thereto. For this science is concerned with the salvation of man to be perfected through virtue and felicity.<sup>54</sup>

As mentioned above, even with the lost divisions, this is the second longest part of the *Opus maius* and covers everything which Bacon considers vital to man’s salvation. This ranges from knowing the meaning of God to the proper methods of worship to the various types of virtue as explained by Aristotle. He also includes Stoic doctrines about anger and adversity as shown through extensive quotations from the works of Seneca. The fourth section of Part VII is a comparison of religions and sects in part because he is pleading for all to believe in the religion “which the human race should accept” because “there is nothing else within the range of philosophy more necessary for man or of such great utility and worth,” and as he has stated before, the sciences are subordinate to this moral philosophy.<sup>55</sup> Everything that is worth knowing will lead man to eternal salvation. It is important to understand what others believe in order to combat their misconceptions and errors which is why comparative religion is a necessary part of

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<sup>53</sup>Bacon/Burke (trans.). *Opus maius*, VI, pp. 632-633.

<sup>54</sup>Bacon/Burke (trans.). *Opus maius*, VII.1.1, p. 635.

<sup>55</sup>Bacon/Burke (trans.). *Opus maius* VII.4.1, p. 787.

Christian education.

Although the conclusion of the *Opus maius* has not survived, the surviving portion of the section on Moral Philosophy ends with what seems to be the intent of the entire work, i.e. showing what a man should seek in life to lead him to heaven. The final lines from Bridges' edition read, "And therefore by participation in Christ we become Christ's. And for this reason the Scripture says, 'I have said, ye are gods'; and elsewhere, 'Do not touch my Christs.' And what more can a man seek in this life?"<sup>56</sup>

#### 6.4 Astrology in the *Opus maius*

While the majority of Roger Bacon's views on astrology are found in Part IV, there are brief mentions of it in Part I, although not by name. In describing why philosophy was rejected by Christian leaders, Bacon makes reference to areas in which philosophy seemed to be invading religious territory because "it seemed, I say, to be contending with preachers of the faith, whose peculiar province it was, not through nature and art, but through the virtue of God, to utter prophecy of future events. ...for that power of prophecy is able to accomplish great results."<sup>57</sup> This power of prophecy, of predicting the future, was being wrested from the Church by means of magic and philosophy. Magic and superstition were conflated with philosophy as threats to Christianity even though "it was hated by philosophers and fought by them all."<sup>58</sup> Before giving a detailed explanation of all the topics worthy of study, Bacon must justify opening these areas for study at all in the Christian context, and his argument is that philosophy, in and of itself, is a way to truth once the "fraudulence of the art of magic was purged away" and could be applied to

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<sup>56</sup>Bacon/Burke (trans.). *Opus maius*, VII.4.1, p. 823. Bacon is quoting Psalms 82:6 and 105:15.

<sup>57</sup>Bacon/Burke (trans.). *Opus maius*, I.14, p. 32.

<sup>58</sup>Bacon/Burke (trans.). *Opus maius*, I.14, p. 32.

divine knowledge.<sup>59</sup> He appeals not only to the ancient philosophers like Aristotle, Hippocrates, Galen and Ptolemy, but also to religious figures. In his plea for the study of various languages, he makes reference to “the saints like Moses and others” who “performed their works under chosen constellations...by the locations of which they changed and excited men to many things, without loss of freedom of the will.”<sup>60</sup> This is only the beginning of his defense and attempt to justify the practice astrology.

Unlike in Ptolemy’s *Tetrabiblos* and Abū Ma’shar’s *Kitāb al-Madkhal al-kabīr*, Bacon’s defense of astrology is not confined to an introduction but is instead more of a running theme throughout much of Book IV. Because of the nature of the *Opus maius*, and the fact that it was written as a *persuasio* rather than a technical introduction to astrology, it was necessary for Bacon to justify the practice of astrology and its inclusion in his revamped Christian education. The defense of astrology as presented by Bacon can be divided into four parts which are similar to but distinct from the defenses of Ptolemy and Abū Ma’shar. As both Ptolemy and Abū Ma’shar had done, Bacon does begin with references to the definitions of astrology versus astrology, but he does not place the same kind of importance on this aspect as his predecessors. Second is how astrology works, and here, Bacon exceeds both Abū Ma’shar and Ptolemy in his description which relies heavily on al-Kindī’s doctrine of rays but also bears some similarity to Ptolemy’s brief explanation in the *Tetrabiblos*. Third, Bacon explains why it is worth practicing, and here, he differs from his predecessors in that his plea is religiously-based and that he has to overcome the misunderstandings of astrology which he knows exists for many Christians. Fourth, Bacon must deal with the issue of free will. This issue appears to be the most important area for

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<sup>59</sup>Bacon/Burke (trans.). *Opus maius*, I.14, p. 33.

<sup>60</sup>Bacon/Burke (trans.). *Opus maius*, III.14, p. 114.



Bacon and dominates much of the fourth book of the *Opus maius*. He addresses determinism much more overtly than Abū Ma'shar did, but he follows Ptolemy more with attributing earthly causes as a way of ameliorating the influences of the planets.

## 6.5 Definition and Differentiation

Roger Bacon's definition of astrology presents a way of defending astrology which ultimately differs from the methods used by Ptolemy and Abū Ma'shar, one that tries to fit astrology into the sciences which have eternal value, while at the same time preserving as much of the traditional aspects as he can. Part IV, beginning with the second distinction, demonstrates the pattern Bacon has set. He begins, as Ptolemy and Abū Ma'shar did, by defining astrology and astronomy, and demonstrating the differences between them. Throughout Part IV Bacon is inconsistent in the terms he uses to refer to the two sciences. He is not worried about using any supposedly-correct terminology of *astronomia* and *astrologia* set out by Isidore because "they are called so indifferently by Ptolemy and Avicenna and many others."<sup>61</sup> The "true mathematicians" do not bother separating the terms.<sup>62</sup> However, in the beginning of his discussion into the various types of astrology, he separates them into *astrologia speculativa* and *astrologia practica*. However, his use of the Latin terms is inconsistent, in keeping with his lack of concern for the formal terminology. Speculative or theoretical astrology roughly corresponds to astronomy. It is the branch concerned with the "quantities of all that is included in celestial things... For it gives us definite information as to the number of the heavens and of the stars."<sup>63</sup> Practical astrology

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<sup>61</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 264.

<sup>62</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 264. The Latin sentence reads "Sed veri mathematici, quos in hac parte vocamus astronomos et astrologos, quia indifferenter a Ptolemaeo et Avicenna et aliis pluribus sic vocantur..." See Bridges. 1897, p. 242.

<sup>63</sup>Bacon/Burke (trans.). *Opus maius*, IV.2.1, p. 128.

“enables us to know every hour the positions of the planets and stars, and their aspects and actions, and all the changes that take place in the heavenly bodies.”<sup>64</sup> The information gathered in practical astrology, through instruments and tables, prepares the way for “the judgments that can be formed in accordance with the power of philosophy, not only in the things of nature, but in those which take their tendency from nature and freely follow celestial direction.”<sup>65</sup> The foundations of astrology, be it speculative or practical, lie in mathematics because of the Aristotelian principle of causes, which is the only way in which things can be known. Celestial movements cause terrestrial events. “Therefore these terrestrial things will not be known without a knowledge of the celestial, and the latter cannot be known without mathematics.”<sup>66</sup>

Where Bacon does attempt to clear up inconsistencies in terminology is in the word *mathesis* which is the foundation of the word *mathematica* or “true mathematics.”<sup>67</sup> With an etymology that is more reminiscent of the ancient attempts to explain word origins without any real accuracy, he states that the reason mathematics has a bad reputation among theologians is due to a misunderstanding of the words. *Mathematica* is “derived from this word *mathesis* with short middle syllable, meaning knowledge, and it is certainly derived from the Greek...whence *mathematica* is instructional and theoretical” while the word for false mathematics is said “to be derived from *mathesi* with long middle syllable, meaning divination, or with greater certainty, from *mantos* or from *mantia*, which are the same as *divinatio*...”<sup>68</sup> By separating the two types of

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<sup>64</sup>Bacon/Burke (trans.). *Opus maius*, IV.2.1, p. 128.

<sup>65</sup>Bacon/Burke (trans.). *Opus maius*, IV.2.1, p. 129.

<sup>66</sup>Bacon/Burke (trans.). *Opus maius*, IV.2.1, p. 129.

<sup>67</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 261. See also Bridges edition, p. 239.

<sup>68</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 261. See also Bridges edition, p. 239. There is no Greek word *mathesi* corresponding to Bacon’s etymology in Liddell and Scott. μάθησις is

“mathematics,” Bacon is attempting to legitimize astrology. The false mathematics is magic which is to be condemned, but true mathematics is knowledge. Astrology has been falsely placed in the magic variety. The false mathematics is the type that deprives mankind of free will and has been condemned by all Christian scholars as well as the Greco-Roman philosophers like Aristotle and Plato. These magicians also claim to use celestial demons “which is wholly wicked, and, moreover, defile their studies in regard to the heavenly bodies...” However, the most important reason for condemning this type of mathematics is because it hinders the development of faith.<sup>69</sup> Bacon’s method of placing astrology in the arena of true mathematics allows him to claim it as a valuable part of Christian education. Of course, this is only the beginning of his defense.

These preliminary remarks on astrology lead to his lengthy *apologia* on the limits and merits of astrology. Initially, it is difficult to determine just how far Bacon is really willing to go beyond the accepted astrometeorology which was commonly accepted by Christian scholars. What is clear is Bacon’s attempt to separate astrology as a superstitious art practiced by charlatans from what he sees as a mathematics-based science deserving of extensive research and attention.<sup>70</sup> This same separation can be seen in other works, such as a letter written by Bacon on art and nature vs. magic. Nature is powerful, and art making use of nature is also powerful, but magic, and anything which is “beyond the operation of Nature or of Art is not human or is a fiction and the doing of fraudulent persons.”<sup>71</sup> Referring directly to astrology, Bacon says that

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translated as “the act of learning, getting of knowledge, while μάθημα can be the mathematical sciences or knowledge or astrology itself.

<sup>69</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 263.

<sup>70</sup>Hackett. 1997, pp. 183-184.

<sup>71</sup>Roger Bacon/Davis (trans.). *On the Nullity of Magic*, p. 15. The intended recipient of the letter is not known for certain. Davis cites William of Auvergne or John of Basingstoke as viable possibilities. See p. 51.

there is much error in the practice because of the inherent difficulty in perceiving the “certitude of the heavens”<sup>72</sup> and that leads to frauds claiming to be skilled in astrology and deceiving the public. However, he also points out that “those who are well-skilled and understand the art sufficiently may be able, at chosen times, to do many useful things both in act and in judgment.”<sup>73</sup> He does not rule out the ability of the stars to affect change on the earth, nor the ability of the astrologer to utilize his knowledge of stellar influence. His presentation, although brief, bears a resemblance to that of Ptolemy in emphasizing the difficulty of practicing it correctly. Done properly, astrology is a valuable tool, but it is hard to do it properly, and it is the frauds which condemn the art as a whole. Philosophers reject astrology because of those who purport to consort with demons and who use sleight of hand and elaborate incantations to fool their customers. Philosophers see the falsity and condemn the “false mathematics.”<sup>74</sup> By the same token, the sacred writers condemn astrology in a similar manner, but they also reject astrology for additional reasons, e.g. because people “fashion their morals in accordance with the heavenly bodies, under the impression that they were made of necessity by the heavenly bodies and by the other agencies mentioned.”<sup>75</sup> They even go so far as to ascribe the miracles and wonders of Christ and the prophets, not to the power of God, but to magic.

In an effort to support his assertion that astrology can be safely practiced, Bacon uses quotations from a number of philosophers, showing the proper attitude toward astrology and the truth of its relation to “divine certitude.” “Let the nobler philosophers be cited, namely, Aristotle,

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<sup>72</sup>Roger Bacon/Davis. *On the Nullity of Magic*, p. 20.

<sup>73</sup>Roger Bacon/Davis. *On the Nullity of Magic*, p. 20.

<sup>74</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 263.

<sup>75</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 263.

Avicenna, Ptolemy, Hali [Abū al-Ḥasan ‘Alī ibn Abī al-Rijāl] his commentator, Messehalac [Māshā’allāh], and Albumazar, on whom more than on others rest this burden.”<sup>76</sup> He cites Ptolemy a number of times in this section mostly from the pseudo-Ptolemaic *Centiloquium* and from Ptolemy’s *Tetrabiblos*, using the Latin title *Quadripartitum*. Using Ptolemy’s explanation, he explains that astrology is a complicated art and requires much study to master, but he quotes from the first chapter of the *Tetrabiblos* that “the hidden profundity of this art so excellent and its practice so majestic and incomprehensible, that it cannot be wholly grasped by human genius, seem to be the result of its ineffable subtlety and of a certain divine quality as it were belonging to it.”<sup>77</sup>

## 6.6 How Bacon’s Astrology Works

The causes of celestial influence are explained by the existence of emanations from the stars (called *species* by Bacon). Bacon follows al-Kindī in his *De aspectibus* in the doctrine of extramission, i.e. that everything gives off corporeal rays. This is what makes vision possible but also is the source of celestial influence because the stellar rays strike the earth and cause

every action in this world; for it acts on sense, on intellect, and all the matter in the world for the production of things, because one and the same thing is done by a natural agent on whatsoever it acts, because it has no freedom of choice; and therefore it performs the same act on whatever it meets. But if it acts on the sense and the intellect, it becomes a species as all know.<sup>78</sup>

This species can be understood through the use of mathematics and Bacon devotes the rest of the second distinction and most of the third to explaining how the rays function, the angles at which they strike the earth and the geometry governing their motion and multiplication. These rays from

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<sup>76</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 264.

<sup>77</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 265.

<sup>78</sup>Bacon/Burke (trans.). *Opus maius*, IV.2.1, p. 130.

the celestial realm are the cause of many natural events on earth because “light generates heat, heat generates putrefaction, putrefaction death, and wine inebriates, and so of every agent, because it produces many effects besides its own species and force univocal to itself.”<sup>79</sup> The causes of these various events can ultimately be traced to the stars because of the complex connections between various causes and effects. In this way, “the sun and the stars cause all things here below” and the heavens are moved by the angels. These indirect causes from the rays are not as strong, however, as direct rays, and “nature acts with more force in the straight line than in the broken or reflected one.” The rays which comes from the stars will have more influence on the earth when they are received directly rather than indirectly.<sup>80</sup> Thus, the rays which fall on the earth and are perpendicular to the earth’s surface will have more force than any other rays. In chapter three of the third distinction, Bacon explains why the force is greater for the rays which are perpendicular through the use of elementary geometry. The apex of the rays coming from celestial bodies will be centered on whatever receives the most force, i.e. the most direct ray will strike with the most force and will receive “more of the sun’s substance, and therefore has more force.”<sup>81</sup> Citing Averroes, Bacon states that the stars and planets we can see are made up of the “transparent celestial substance” which is “condensed in the body of the star” and it is for this reason that “it has a strong force in the alteration of the world.”<sup>82</sup> These rays and the forces emanating from the substance of the stars to the earth are the causes of the various events on earth. Because the rays emanate in all directions, they have an effect on everything

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<sup>79</sup>Bacon/Burke (trans.). *Opus maius*, IV.3.1, p. 139.

<sup>80</sup>Bacon/Burke (trans.). *Opus maius*, IV.3.1, p. 139.

<sup>81</sup>Bacon/Burke (trans.). *Opus maius*, IV.3.3, pp. 146-147.

<sup>82</sup>Bacon/Burke (trans.). *Opus maius*, IV.4.1, p. 149.

around them and “the cosmos becomes an intricate network of forces responsible for everything from the radiation of heat to astrological influence and the efficacy of prayer.”<sup>83</sup> This idea of rays and their multiplication comes from Bacon’s conflation of al-Kindī’s works *De aspectibus* and *De radiis*. An understanding of the manner in which the rays function is necessary for the body and the soul. This is because the person who understands the rays is able to avoid the harmful rays or at least the stronger of the harmful rays. “And these considerations have place when a man is exposed to harmful celestial impressions like the sun in summer and the moon at night, which exhaust our bodies.”<sup>84</sup> The rays are the causes of everything on the earth from natural motions such as the tides to the birth of children.

It is in mentioning childbirth and its connection to the rays that Bacon begins to tread in territory which is slightly dangerous. Speaking of the tides as he does is not a problem, nor is his lengthy investigation of the rays and how they impact the terrestrial realm, but attributing power over human lives to the stars is more difficult to justify. This first mention of the stellar influence on human beings is brief and contains little commentary. His explanation of how the influence happens harks back to Ptolemy’s defense of astrology on the basis of the existence of other earthly causes which complicate the *sympatheia* from the stars. In the conception and birth of a child, “not only the multiplication of celestial force is operative, but that of father and mother, since forces are determined in the seeds, as physicians teach.”<sup>85</sup> The principle which the child receives from the mother is important because that is the dominant source of influence until birth when the child is “exposed to a new air, another world as it were” and then “receives apexes of

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<sup>83</sup>Lindberg. 1997, p. 245.

<sup>84</sup>Bacon/Burke (trans.). *Opus maius*, IV.4.7, p. 163.

<sup>85</sup>Bacon/Burke (trans.). *Opus maius*, IV.4.5, p. 159.

celestial pyramids as respects his separate members, and thus receives new impressions, which he never gives up, because what the new jug receives it tastes of when it is old.”<sup>86</sup> These new impressions lead to the formation of the child’s *complexio radicalis*, his basic physical constitution, which leads to “inclinations to morals and to sciences and languages, and to all the trades and occupations, and to all that diversity which we see in all things.”<sup>87</sup> Depending on the arrangement of the heavens, the influence on the child’s disposition can be good or evil, exceptional or mediocre, but here, Bacon is quick to note that this does not have to be permanent, “...although he will be able to change himself through free will, God’s grace, temptation of the devil, and good or bad counsel, especially in youth.”<sup>88</sup> This format is common throughout Bacon’s presentation of astrology: a statement of certainty, followed immediately by the upholding of free will, no matter how seemingly deterministic his previous claims are.

Bacon returns again to how the heavens influence the earth later in Part IV in his explanation of the extent of the ability of the true mathematicians to predict the future. A real astrologer (or a true mathematician) will not claim to have certain knowledge, but “they consider how the body is altered by the heavens, and when the body is changed the mind is aroused now to private actions and now to public ones, yet in all matters is the freedom of the will preserved.”<sup>89</sup> In his description of the power of the planets, Bacon shows his desire to walk that narrow line between acceptable and dangerous ideas. There is a freedom of the will. The ‘rational soul is not compelled to its acts,’ but the celestial forces can cause it to desire certain things,

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<sup>86</sup>Bacon/Burke (trans.). *Opus maius*, IV.4.5, p. 159.

<sup>87</sup>Bacon/Burke (trans.). *Opus maius*, IV.4.5, p. 159.

<sup>88</sup>Bacon/Burke (trans.). *Opus maius*, IV.4.5, p. 160.

<sup>89</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 270.



“those things which they previously did not wish for, although they are under no compulsion.”<sup>90</sup>

The rays given off by the planets are such that they can incite men to do things they would not have done otherwise. This is a power which affects men’s minds and souls, but the strongest influence is actually on men’s bodies and internal organs and “when these have been greatly altered the man will be strongly excited to actions for which he did not previously care, the freedom of his will remaining unaltered.”<sup>91</sup> Bacon uses the example of the sun to demonstrate the power of the planets in being able to alter things on the earth. Depending on where the sun is in its orbit around the earth, it causes things to grow and decay, and in conjunction with the other planets, it has extra power to influence men’s minds. The astronomer<sup>92</sup> makes predictions based on the complexions of men, “which spring from celestial influence, like all generation” and so “it is not surprising if he extends this influence to the sphere of human actions.”<sup>93</sup> In fact, according to Bacon, following a common belief in the practice of astrology at a general level, regional differences are due to the heavens, not to the individual person. Thus, the “complexions of their bodies innate from the nature of the heavens, under the different parallels and stars of which they are situated, and in accordance with the diversity of their location with respect to the planets” lead to the wide varieties of people who live at different climes.<sup>94</sup> Every change, every influence from the heavens has its origin in the rays which come down in the shape of a pyramid with the

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<sup>90</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 270-271.

<sup>91</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 271.

<sup>92</sup>The Latin term used in this section, in keeping with Bacon’s lack of concern with terminology, is *astronomus*. See Bridges edition, p. 250. On the following page, in a section on the use of the stars in making judgments on communities, both *astronomus* and *astrologus* are used to reference the person making the prediction for a city or a larger region around a city.

<sup>93</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 272.

<sup>94</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 272.

strongest influence coming from the vertex of each individual ray.

The last section of Part IV of Bacon's plea is, once more, a return to the subject of the influences from the heavens, in this last case, a look at how the heavens can influence the earth.

It is divided into four topics

namely a certification of the natures of the fixed stars and of the planets, that by these means a surer certification may be made of all the characteristics of the places and things located to the end that a judgment may be made respecting the present, past, and future, so that at length, in the fifth place, actions may take place promoting all things advantageous to the state and excluding all things harmful.<sup>95</sup>

Invoking Aristotle and Averroes, Bacon speaks of how much influence the heavens have on the earth. "It is a fact, according to Aristotle, that the heavens are not only the universal, but the particular cause of all terrestrial things."<sup>96</sup> It is interesting that, for all his previous vehemence in protesting the lack of influence on human beings that he can here say, quoting Aristotle that "man begets man with the help of the sun" and then later, Averroes, that

the sun does more than man in producing a thing. For the force of the sun continues in the seed from the beginning of generation to the end, while that of a father does not, but is confined to one act only, namely sowing of the seed; and therefore it would accomplish nothing, unless the force of the sun were continuously multiplied and infused, regulating the whole generation.<sup>97</sup>

There are four causes which originate in the heavens and have an effect here on the earth. The first is the universal cause which has to do with the distance of the sun from various places in the world. The second is the particular cause "namely, the diversity of the fixed stars above the heads of the inhabitants. For in particular by means of these stars do natural things vary in different regions, and men also, not only in their natural qualities, but in their morals, sciences,

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<sup>95</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 391.

<sup>96</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 394.

<sup>97</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 394-395.

arts, languages, and in all other things.”<sup>98</sup> The various stars in the heavens impact the inclinations of men on the earth, according to the area in which they live. The third cause comes from the twelve zodiacal signs and the forces which arise from them.

For the different signs are dominant in different regions, either because at the beginning of the world they were in the direction of those creatures when they received their first forces, and what the jar receives when new it retains the savor of when old; or because they are similar in nature to the stars which revolved over the heads of the inhabitants.<sup>99</sup>

The signs of the zodiac can affect people on the earth both at birth from the “first forces” and throughout their lives. The fourth cause from the heavens comes from the power of the planets on the earth. These are regional effects. “For the planets are assigned to the different regions owing to their domination, as in the case of the signs, and this follows from the twofold cause stated.”<sup>100</sup> Neither the effects of the zodiac nor the effects of the planets on regions are universally agreed upon because the various ancient authorities differ and Bacon states that it will take a treatise dedicated to the subject to determine who is correct. One of the complications is due to the fact that while there are regional effects which can be demonstrated, there are variations because of interactions among the planets and signs which vary depending on the characteristics of the things being affected. Individuals in regions also vary according to the time of day and which planet is dominant at particular hours and what effects that planet will have on the various parts of the body.<sup>101</sup> In all these cases, Bacon does not dismiss the power of prediction based on free will. He speaks of the effects of the heavens on various parts of the body, on the complexions of individuals all without reference to anything but the value of astrology to medicine because of its

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<sup>98</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 395.

<sup>99</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 395.

<sup>100</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 395.

<sup>101</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 396-397.

predictive power. It is not until he gets to an explanation of the effect of the planets on the mind that he brings up the will again. “And further, as the complexions vary, the minds are aroused and influenced to desire gratuitously to follow the motion of the complexion, even in all voluntary actions, the liberty of the will, however, in all cases being preserved.”<sup>102</sup> Here we have again, the strong influence of the heavens, but at the last, the preservation of the will. The heavens can be the primary cause of every physical attribute of an individual or a particular race, but when it comes to the mind of man, the heavens have the ability to influence, to create new desires, even to incite men to wish to follow those desires, but ultimately, he repeats the required freedom of the will.

## 6.7 The Benefits of Astrology

Bacon’s defense of astrology runs the gamut from quoting early Christian theologians such as Augustine to advocating the study of astrology on the basis that it is a subject which allows for knowledge of the past, present and future and is thus of great worth to theology. In addition, studying astrology and astronomy leads to better knowledge because they are to “give explanations and full certitude in regard to the places in the world. Wherefore these sciences are very necessary in this particular.”<sup>103</sup> Like his explanations for how astrology works, Bacon’s description of the benefits of astrology are spread through Part IV and include the simple increase of knowledge but more on how astrology can aid Christianity and Christians in defending themselves against outside threats.

One of the first ways in which astrology gives great benefit to practitioners, according to Bacon, is the power and influence the astrologer can have on the course of nations if he has

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<sup>102</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 398.

<sup>103</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 205.

studied the use of the heavens in detail and therefore is well-versed in the movements and influences of the celestial objects. “For in accordance with variations of this kind in the constellations and complexions and wishes of princes and prelates innovations in habits and change in laws and customs arise in a people on higher authority.”<sup>104</sup> Good counselors influence for good, and evil for evil. In Bacon’s example of how an astrologer can help the rule of a nation, he notes that, because of the power a prince has over his people, influencing the course of a state is more easily accomplished if the astrologer simply knows the nativity of the prince himself, “for that which pleases the prince has the force of law.”<sup>105</sup> An astrologer, well-placed in the royal court is obligated to know the nativity of the ruling prince in order to influence the affairs of cities and kingdoms and to know it so well that he can be aware of the times when the prince’s morals will be altered by the positions of the heavenly bodies.

If, therefore, from the constellation of the nativity and conception the complexion of any prince, or of another on whom he relies, is found disposed to perversity of morals and to discords and wars, and if the astronomer at the same time with this sees that men are influenced in this way in the formation of habits and are more strongly aroused when a like constellation happens, he is able to give a rational judgment regarding the woes of the state and kingdom over which they rule, when the arrangement of the heavens and of those things which are renewed by celestial forces, like comets, and the like, happen conformably.<sup>106</sup>

The benefits of the presence of a skilled astrologer in the court are immeasurable to the preservation of a nation. Of course, this is not the first time that the idea of astrology having an influence on the course of a nation has arisen. The court astrologers in the Roman empire sometimes had so much influence on the emperor that they could affect the succession. In Bacon’s view, this kind of power in a royal court can only be a good thing if the astrologer is

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<sup>104</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 274-275.

<sup>105</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 274.

<sup>106</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 275.

well-educated in the movements of the heavens and their effects. He concludes this example with another rejection of the misunderstandings which have arisen regarding the practice of mathematics, owing to its false association with magic. To Bacon, mathematics does not deserve to be blamed, “but to be embraced warmly and loved owing to the glorious utilities which can come out of the judgments of true mathematics, which in no way is contradictory to the truth.”<sup>107</sup>

After a brief digression into the basic elements of practicing astrology, Bacon returns to the benefits of astrology, this time as related to religion. He discusses the influences of the planets on various sects in Part VII of his plea. Referring to Abū Ma’shar’s treatise on Jupiter-Saturn conjunctions, Bacon looks at how these conjunctions influence the course of religions throughout history. In reference to Christianity, he claims that it can be shown that Christianity is the greatest of all the sects “by reason of the noble nature of its lawgiver and of the sect itself, that no other sect is worthy, but all others are the figments of men.”<sup>108</sup> He uses the three types of conjunctions between Saturn and Jupiter, those which occur every 20 years, every 240 years and every 960 years, to predict the end of Islam because Abū Ma’shar said that

the law of Mahomet cannot last more than 693 years. But so long is it able to last and will last, unless owing to some coincident cause, the time shall be shortened as we explained before, since a shortening can take place greater or less from different causes.<sup>109</sup>

At the end of this, Bacon again reiterates that although scholars like Abū Ma’shar make statements that

sects depend on the freedom of reason, yet they do not place any necessity on freedom of

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<sup>107</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 275.

<sup>108</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 284.

<sup>109</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 287. Bacon uses these same conjunctions and the signs in which they occur to reference significant events in Christianity, such as the birth of Christ and the appearance of various heretical sects, e.g. conjunctions occurring in the signs of Cancer, Libra and Capricorn indicate big changes in sects and empires.

the will, saying that the planets are signs hinting to us those things which God arranges from eternity to take place either through nature, or through human will, or by his own plan in conformity with the good pleasure of his will.<sup>110</sup>

This could be a reference to the fact that, in *Kitāb al-Madkhal al-kabīr*, Abū Maʿshar does not concern himself with the religious issues of freedom of the will, and that he does not even reference God often in his defense. Even so, each of the “principal sects,” which are comprised of the Pagans (those who worship no god), the Idolaters (who worship many gods), the Saracens (the Muslims), the Jews, the Christians and last of all, Antichrist, each are governed and influenced by a law of one of the planets.<sup>111</sup> This is the first distinction among them, and

upon that the other distinctions follow, since the celestial influence inclines a man to receive the laws, either as a controlling influence, or as an important one, or as one that renders the reception easier. For although the rational soul is not forced to anything, yet, as we proved above, a man’s habit of thought is much altered with regard to the sciences, morals, and laws. By these changes the soul is stimulated as far as the action of the body is concerned and is influenced to acts both public and private, with complete freedom of the will, however, in all matters.<sup>112</sup>

Again, freedom of the will is paramount, but as he has already stated, the heavenly bodies alter the body which then excites the soul to some religious desire, to choose one of the sects.

Significantly, here and in the discussion that follows, Bacon gets rid of any possibility that he might think the planets are only the signs of God. The movements are *known* by God, but more than that, “the planets are thus not only signs, but do something in the way of excitation.”<sup>113</sup>

Beyond a person’s choice of sects, within Christianity, a knowledge of the movements of the heavens and their effects can lead a Christian to a greater love and appreciation of his Creator.

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<sup>110</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 287-288.

<sup>111</sup>Bacon/Burke (trans.). *Opus maius*, VII.4.1, pp. 790-791.

<sup>112</sup>Bacon/Burke (trans.). *Opus maius*, VII.4.1, p. 791.

<sup>113</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 288.

Interestingly, in presenting this love as a benefit of astrology, there is another missing assertion of freedom of will. In fact, Bacon seems to backtrack, citing Abū Maʿshar and a philosopher named Alchimus<sup>114</sup> and the text *Ovidus de vetula*,<sup>115</sup> although in this case, it is in deference to God, but still with the planets being a vital part. “Therefore God has willed so to order his affairs, as to show by means of the planets to rational souls certain things which he saw beforehand and predestined to happen, with the intention doubtless that the human mind, recognizing the wonders of God, might grow, inflamed to a love of its Creator.”<sup>116</sup>

Bacon returns again to the benefits of astrology after a presentation on his calendar reforms. Astrology is valuable “in two principal ways: in one, because of the knowledge it gives us of the future, present, and past; in the other, in useful works.”<sup>117</sup> In terms of predicting the future, Bacon has referred to it multiple times already, but again, he feels the need to reiterate the same point.

But the principles concerning the knowledge of the future have been touched upon above in that distinction in which I argued in excuse of mathematics, and showed that a sufficient judgment is possible in all things, which rests between what is necessary and what is impossible, and between the universal and the particular. For by these means is the human mind illuminated, so that it is able to discourse wisely on all topics and to provide advantageously for itself and for others.<sup>118</sup>

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<sup>114</sup>This Alchimus could be an early Christian philosopher based on Bacon’s reference. According to Thorndike, both are cited in the work *Cosmography* which Bacon also mentions. See Thorndike. 1923, p. 602.

<sup>115</sup>The text of *De vetula* is a poem written in the thirteenth century, attributed to Ovid, which contains references to Aristotle and Abū Maʿshar and their connection to astronomy. Not only is Bacon influenced in his perception of Abū Maʿshar’s presentation of the Virgin Birth, but he also takes from the text a portrayal of Aristotle as monotheistic. See Hackett. 1997, pp. 193-195.

<sup>116</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 288.

<sup>117</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 306.

<sup>118</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 306-307.



Here, Bacon's explanation is almost identical to the philosophical section of Abū Ma'shar's defense, using an extensive explanation of the existence of the possible and how it fits into the work of astrology. The human mind receives the influence of the possible rather than the necessary and impossible. However, the caveats disappear almost completely when Bacon moves on to discuss the benefits of using astrology in matters of medicine. He has already stated that the human body is directly affected by the stellar rays and thus, when it comes to matters of the body, the stars have a direct influence on health and sickness.

But an effect is known only by means of its cause, as all know; but celestial things are the causes of things below, whence these things that are generated must be known through those that are not generated, namely, celestial things. That, moreover, celestial things not only are universal causes, but the proper and particular causes of things below, is proved by Aristotle, who says in the second book on Generation, that the elements are less active than the tools and instruments used in an art are in comparison to the artificer.<sup>119</sup>

Celestial things cause earthly events; therefore, in order to understand earthly events, one must understand how the celestial function because they are both universal *and* particular causes. He then goes on to explain that "the only agents are the heavens and the elements, which are the instruments of the heavens."<sup>120</sup> There is no reference to God as the first cause (which will be stated in Part VII), and the heavens are the *only* cause of things on the earth. It is also interesting to note that, in this case, there is no qualification, no instant upholding of free will, only a statement which sounds suspiciously like a claim of determinism because the heavens are the source of all causes and even the elements of the physical world function under the power of the heavens. Bacon's defense in this case is that sickness is related to the body rather than to the soul and that astrological medicine was the least offensive type of astrology practiced in the Middle

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<sup>119</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 307.

<sup>120</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 307.

Ages.

The knowledge of the heavens can be manipulated for evil, but good men will use it for good. Bacon even goes so far as to suggest that an adept human mind can somehow join with the powers of the heavens and change the minds of those around him.

For when the purpose, desire and force of the rational soul, which is nobler than the stars, are in harmony with the force of the heavens, of necessity either a word or something else is produced of wonderful force in altering the things of this world, so that not only the things of nature, but human minds are drawn toward those things which the skillful adept wills, the freedom of the will remaining unimpaired, since the mind can follow the celestial forces fully without compulsion, as we showed and stated in the proper place.<sup>121</sup>

This power of the rational soul is such that Bacon places it above the nobility of the heavens below only God and the angels. For this reason, incantations and images created by a skilled practitioner may act on the world using the power of the heavens but acting *through* the image itself long after the constellation has receded in its power. These methods are often placed in the same subject as superstitious magic or that wrought by demons, but in the hands of someone trained, these are real arts which are made through an understanding of astrology.<sup>122</sup> Bacon makes an effort to separate the astronomical incantations from the magical incantations, but it is questionable as to just how convincing such an argument would be.

What makes astrology so important for Christianity that Bacon devotes so much time to its defense and to making it acceptable to Catholic doctrine? In general terms, it is for the same reason that every other subject is vital: because “by the light of knowledge the Church of God is governed, the commonwealth of the faithful is regulated, the conversion of unbelievers is secured, and those who persist in their malice can be held in check by the excellence of

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<sup>121</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 410.

<sup>122</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 412-413.

knowledge.”<sup>123</sup> When he arrives at the end of Part IV, Bacon elaborates on why this is all so important.

I am writing these facts not only for scientific consideration, but because of the perils which happen and will happen to Christians and to the Church of God through unbelievers, and most of all through Antichrist, because he himself will employ the potency of science and will convert all things into evil.<sup>124</sup>

Knowing about the uses and powers of the heavens is vital for Christianity because the enemies and unbelievers will be using this same knowledge against the Christians, in order to destroy them. Antichrist will be the most dangerous because he will have the most power and most ability to destroy through his understanding and use of astrology.

By this wonderful method without war he will accomplish what he wishes and men will obey him just as beasts and he will cause kingdoms and states to fight against one another on his behalf, so that friends may destroy friends, and thus he will accomplish his desires regarding the world.<sup>125</sup>

If Christians do not learn to make use of a knowledge of the heavens and of the ways in which the power of the heavens affects the earth, Antichrist will utilize those tools in order to subjugate all of Christianity to his will. Already, the Tartars and Saracens have done this in many places in the world because they have court astrologers who keep them informed of what is happening in the heavens. “They could not have done this by force of arms, as is obvious, and hence they must have succeeded by means of science and especially by means of astronomy, by which they profess to be ruled and directed in all things.”<sup>126</sup> His most powerful plea for learning astrology, however, comes a few pages earlier in his discussion of the powers of the various planets. Mars,

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<sup>123</sup>Bacon/Burke (trans.). *Opus maius*, I.1, p. 3.

<sup>124</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 415.

<sup>125</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 415.

<sup>126</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 416.

which has a fiery nature, is what incites war and anger and all discord. This is something that can be seen in the history of the Church through the wars in England, Spain, Italy and other places.

Bacon laments the ignorance of his fellow Christians and the loss that was incurred because of it.

Oh, how great an advantage might have been secured to the Church of God, if the characteristics of the heavens in those times had been discerned beforehand by scientists, and understood by prelates and princes, and transferred to a zeal for peace. For so great a slaughter of Christians would not have occurred nor would so many souls have been sent below.<sup>127</sup>

In the end, Bacon feels that it is only through utilizing astrology, something known to the enemies of Christianity, that the Church of God can triumph over its foes. Without that knowledge, the defeats and loss of life will continue. To that end, he is willing to struggle with making a science which has dangerous aspects to it acceptable rather than give up the possible advantage it could bestow on those adept at using it.

## **6.8 Determinism in Bacon's Astrology**

In advocating the use of astrology within the Church, Bacon was going against a number of early Christian scholars, including Augustine, and many of his near contemporaries who also devoted time and energy to an examination of astrology. One of these contemporaries was Robert Grosseteste, the Chancellor of Oxford University and the bishop of Lincoln. Bacon admired Grosseteste, but they differed in their views of the scope of astrology. While Bacon accepted influences from the heavens, Grosseteste, in his *Hexaameron*, argued that the stars cannot show evil things and that giving the stars any kind of power denies the free will of mankind.<sup>128</sup> However, another of his contemporaries, Albertus Magnus, had a view that was much closer to Bacon's. Like Bacon, he had to get around the problem of free will while advocating the reality

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<sup>127</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 401.

<sup>128</sup>Grosseteste/Martin (trans.). *Hexaameron*, V.x.8.

of the influences of the stars. His solution was a redefining of fate as all the possible choices available to mankind in any given event.<sup>129</sup> While Albertus Magnus was clear in his solution, the biggest problem in Bacon's defense of astrology is clarifying the role of determinism, especially in order to keep it in line with Christian doctrine. He must be sure to preserve man's free will in every case. Bacon states that freedom of will is preserved even from God Himself because "God has not imposed necessity on human actions, although he has known from eternity how a contingent matter must terminate, and there is freedom of the human will."<sup>130</sup> One of his methods of defense is appealing to past authorities. Many of the ancient Christian and pagan philosophers were aware of the value of astrology, including Ptolemy, Aristotle, Ibn Sina (Latin: Avicenna), Masha'allah (Latin: Messehalac), Haly and Abū Ma'shar, so long as it was practiced in the right way. Following this appeal, Bacon states that many of these authorities do not maintain that

there is an absolute necessity in things below due to the influence of the heavens, because free will is not subject to the things of nature, nor do they think that the decision must be infallible, nay, *they do not even place any necessity on free will, since they do not ascribe it to the things of nature as will be evident*. Therefore, philosophers universally condemn the madness of those false mathematicians.<sup>131</sup>

It is interesting to note that Bacon uses the lack of emphasis on free will which is seen in the earlier authorities as evidence that it is obvious that free will is preserved in real astrology. In contrast to the lack of attention in earlier defenses of astrology, his continual restating of the preservation of free will within the *Opus maius* demonstrates that Roger Bacon is writing for a different audience with different views, one in which the issue of free will is so important that avoiding it will only make things worse. Even with his continual declarations, his position is not

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<sup>129</sup>Price. 1980, p. 184.

<sup>130</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 405.

<sup>131</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 262.

easily discerned because of the method by which he attempts to soften the determinism inherent in the astrology he has inherited from Greco-Roman antiquity and from the Islamic world.

The difficulty Roger Bacon faces in his defense of astrology is that he believes the stars do have power over human lives, both on a general and on a particular level. He states as much when he writes that

in human affairs true mathematicians do not presume to *certain knowledge*, but they consider how the body is altered by the heavens, and when the body is changed the mind is aroused now to private actions and now to public ones, yet in all matters is the freedom of the will preserved. For although the rational soul is not compelled to its acts, yet it can be strongly influenced and aroused so that it gratuitously desires those things to which the celestial force inclines it, just as we see men, owing to association, advice, fear and love and the like, change greatly their intention and gratuitously wish for those things which they previously did not wish for, although they are under no compulsion, like him who in the hope of safety casts into the sea his most precious wares.<sup>132</sup>

The difference is that, in individuals, the mind is only “influenced and aroused” rather than compelled to act. However, the influence from the celestial forces is strong enough to change the human body to the point that the mind will “gratuitously wish for those things they previously did not wish for.” Bacon compares the influences of the stars to things on the earth which can affect men only “to a far greater degree.” He ascribes great power to the stars, but he explicitly excepts free will from that influence. The “mind is strongly excited to its actions, although it is not under compulsion, and in accordance with this principle the judgment of the astronomer is given, and does not imply infallibility or necessity.”<sup>133</sup> The general influence of the stars is even stronger than its particular influence. The stars control the nature of different ethnicities, even their habits and customs. This is because the lines of the rays coming from the stars which affect nationalities are different. Each individual nationality is under the same stars in the same way;

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<sup>132</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 270-271.

<sup>133</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 271.

therefore, the bodies of the inhabitants change from that nature. “The chief cause of this difference cannot be found in the earth or in men, but is sought for in the heavens according to all scholars (*sapientes*).”<sup>134</sup> The diversity of things on the earth is due to the stars, not to earthly influences but to the celestial rays. The varying angles of the rays is what explains the issue of twins, a common criticism of astrology. Each fetus receives different rays at different angles and thus receives different influences which account for the different lives of individual twins.

What about the casting of nativities? In this issue, Bacon’s attempt to walk the fine line between stellar influence and stellar causation is more obvious. A skilled astrologer may cast an accurate horoscope through intense study of the positions and movements of the stars and planets “if he carefully considers when the heavenly bodies will reach these arrangements in accordance with the parts of each” and if he does this, then “he is able to give a satisfactory judgment in regard to all things in nature, such as infirmities, health, and the like, at what time they must happen and how they are limited.”<sup>135</sup> These are all physical effects, caused by the influence of the rays on the various parts of the human body, and if that were all Bacon claimed was influenced by the celestial realm, he would be much more secure. Astrological medicine was much less controversial. However, he goes further. Illnesses and other similar problems are due to the effect of the stars on man’s complexion, weaknesses, health, but “they are not compelled but strongly influenced as manifest” and this is what allows the astrologer to “give a wise judgment regarding the *moral* actions of an individual, in all cases, however, with a preservation of the freedom of the will.”<sup>136</sup> The stars have an influence on the morality, ethics and choices of men, and the

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<sup>134</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 272.

<sup>135</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 273.

<sup>136</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 274.

astrologer can often give a “sure judgment in accordance with the possibility of the subject which he handles.”<sup>137</sup> This leads to what seems to be Bacon’s dominant claim, and his best reason for claiming both celestial influence (meaning that the future can be predicted) and human free will: “For it is one thing to be true, and another to be *rendered true of necessity*.”<sup>138</sup> Astrologers can predict what will come based on the movements of the stars, because the stars give off rays which influence various things on the earth, but on an individual level, that influence does not *have* to be followed. It often is because the influence is very powerful, much more so than any earthly influence, but mankind has free will, as Bacon often repeats.

Regarding Christianity, specifically, the birth of Christ, Bacon has another problem with his celestial influence. Christ’s birth was signaled by many signs in the heavens and He was born of a human mother, and human beings are subject to the rays of the stars, but “it is impossible for God to be subject to a creature.” The stars can only be a sign, not a cause, but no one can deny that Mary was mortal and thus subject to celestial influence. Thus, “the force of the heavens cooperates with the natural force of the glorious Virgin and aided her in so far as she functioned according to nature because man begets man.”<sup>139</sup> Bacon does not endorse the idea that the stars are mere signs. Even in relation to the birth of Christ, he states that it is “not improper to assume that the celestial arrangement is more than a mere sign, taking into account simply the things of nature.”<sup>140</sup> He does not find it to be a problem, but he is quick to assure his reader, i.e. the Pope,

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<sup>137</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 274. The Latin reads “...poterit in multis habere iudicium certum secundum possibilitatem materiae quam tractat.” See Bridges edition, p. 252.

<sup>138</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 274. Latin: “Aliud enim est esse verum, et aliud necessario verificari.” Bridges edition, p. 252.

<sup>139</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 288-289.

<sup>140</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 289.



that these kinds of ideas will be kept within the bounds of the Catholic faith.

The knowledgeable astrologer has the power to effect many changes in his life and in the lives of those around him should he be placed in a position to do so. Bacon gives two examples of how the knowledge of the heavens has been integral in past events. One example comes from a story Josephus relates about Moses and the other from the pseudo-Aristotelian work *Secretum secretorum*. According to Numbers 12:1, Miriam and Aaron complained against Moses because he had married an Ethiopian woman. Bacon adds to the Old Testament narrative that Moses did so when leading the Egyptian armies and continues the story in stating that “owing to the depth of his love, he made, since he was a skillful astronomer, two images on rings, one of forgetfulness which he gave to the woman, and the other of memory which he kept for himself, and thus he freely departed from her with his army and without war.”<sup>141</sup> He later elaborates on the astrological nature of the act, although he is not explicit on the exact means by which it was done, saying that Moses

stirred the mind of the woman by means of the celestial forces received in the material. For as that woman could be changed to purity and to a forgetfulness of her husband by means of images, so could she have been influenced also to adopt other morals, and not she only, but any other woman.<sup>142</sup>

Through his knowledge of the stars, Moses was able to *force* a change on the Ethiopian princess he had married, and in this case, Bacon never mentions the possibility that the woman could have resisted the influence. Moses caused her to forget. This is not just a change to the body but also to the mind or the soul, something he has been careful to avoid as a possibility, up to this point.

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<sup>141</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 407-408. This is an example of image magic which was practiced throughout the Middle Ages and has been said to have originated in the medieval Islamic world. Klaassen. 2003, esp. pp. 168-172.

<sup>142</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 409.

The second example, from the *Secretum secretorum*, is a story of Alexander the Great writing to Aristotle for guidance after he had conquered the world, through the advice of Aristotle.

When Alexander found tribes with very bad morals and wrote to Aristotle asking what he should do with them, that prince of philosophy replied, “If you can alter their atmosphere, allow them to live: if not, slay them all.” Oh, how occult is the reply, yet how full of the power of wisdom! For he understood that in accordance with a change of air, which contains the celestial forces, are the morals of men changed; for which reason the customs of Gauls, Romans, and Spaniards differ from one another, and the same is true concerning all other countries.<sup>143</sup>

This refers back to Bacon’s discussion of how infants begin to be influenced by the air around them at birth, because that air has been affected by the celestial rays. If the air itself could be changed, could be affected by different stellar rays, the morals of the people could also be changed and

they might be influenced to adopt a high moral standard, without, however, losing freedom of will; just as each nation is influenced to adopt its moral standards by its own atmosphere which contains the forces of the stars which are over the heads of the inhabitants, and in accordance with the signs or planets dominant over the particular regions.<sup>144</sup>

Men can be influenced for good or evil without being forced to do good or evil. This is true in matters of influence of peers or the influence of the stars. No matter how strong the influence may be, the option exists that a man can choose.

The example of Moses and his Ethiopian wife is a strange exception to Bacon’s general trend of continually upholding the principle of free will. In the case of Aristotle advising Alexander, the morals of the newly-conquered peoples could only be *influenced*, not forced, but in the case of the Ethiopian princess, there is no indication that she could have resisted Moses’

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<sup>143</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 408-409.

<sup>144</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 409.

attempt to make her forget. The use of images infused with celestial powers comes from the *Centiloquium*,<sup>145</sup> as well as commentaries from Haly and Thebit (Arabic: Thābit ibn Qurra) and Bacon's brief discussion of them does not delve into the matter of free will. Did he forget to add it in? Are women exceptions to the strength of will? Or is this a rare place where Bacon simply *assumed* that preservation of free will is understood? If so, why here and nowhere else? In general, the only sections without a mention of free will are those dealing directly with the physical body rather than the spirit or the mind. Whatever the reason, once Bacon begins his final look at the power of the heavens, the frequent references to the preservation of free will resume.

Here, he spends about a page speaking of the influence of the heavens on the inanimate and on plants and animals, all of which is fully deterministic, indistinguishable from a hard determinist like Manilius. Bacon seems to want everything to be caused by the heavens or perhaps his sources being much more ambiguous than he might have thought, he finds himself being pulled in that direction, but, ultimately, he cannot make that claim for human beings. The heavens are causes "in things correctly generated" and "in the faults of natures and in monstrosities... If moreover we proceed further, we are able to investigate the causes of terrestrial things more properly by means of celestial things. But the first principle in this is that every point of the earth is the apex of a pyramid filled with the force of the heavens."<sup>146</sup>

Roger Bacon's stand on astrology is not always clear within the *Opus maius*, nor even within his other works, e.g. *Communia mathematica* or his translation and commentary on the pseudo-Aristotelian *Secretum secretorum*. However, there are some conclusions which can be

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<sup>145</sup>Ps.-Ptolemy. *Centiloquium*, art. 9. "In their generation and corruption forms are influenced by the celestial forms, of which the framers of talismans consequently avail themselves, by observing the ingresses of the stars thereupon."

<sup>146</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 308.

drawn about how Bacon viewed the practice and science of astrology. One of the most important statements Bacon makes about astrology is that it cannot preempt free will and that means that to some degree it is fallible. This is so important to his overall defense of astrology that he repeats it numerous times throughout Part IV of the *Opus maius*. Indeed, in the context of Christian Europe, the preservation of free will is vital to justifying the practice of astrology in *any* form. Throughout the Middle Ages, Christian scholars, such as Augustine, railed against the possibility that free will could be taken from mankind, that mere fate could dictate the course of a human being's life. If there is no free will, then how can there be sin and punishment for sin? God, being omnipotent and omniscient, and more importantly, completely good, cannot be the source of any evil. Thus, the hard determinism demonstrated by Manilius and Vettius Valens, for whom "Fate rules the world," must be avoided. However, at the same time, Bacon also believes that astrologers *can* make genuine, valid predictions based on the influence of the heavens on the elements and on the characteristics of human beings. What is different here is that he has modified the power of the heavens and "denies that knowledge of this influence can be infallible or that the heavens impose an absolute necessity on human free will."<sup>147</sup>

While he generally confines his statements in the *Opus maius* to simple reassurances that free will is always preserved, in his introduction to the *Secretum secretorum*, Bacon elaborates on how he sees the limits of astrology. Those who try to claim absolute knowledge of things that will happen and claim that knowledge on the basis of fate and necessity are frauds because "true mathematicians do not presume these three positions because they do not judge that anything that was, is or will be, happens by necessity in these contingent and voluntary matters on earth." In addition, these mathematicians (or astrologers) will not try to claim certainty in their predictions

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<sup>147</sup>Hackett. 1997, pp. 185-186.

and always will allow for possibilities. A predicted event “may happen and that it will happen in so far as it is according to the *power of its causes*, and that it will happen in virtue of these causes unless God changes the *Ordained law of Nature and of the Will*.”<sup>148</sup> While in the *Opus maius*, as noted above, Bacon states that not even God will overrule man’s free will because it is one of those things He has given to mankind, here, Bacon states that God can change the law of free will, in effect, circumventing it if He so chooses. However, that would seem to be the only exception to the preservation of free will. Only God has the power to remove it. Nothing below Him has that power.

At the base of all of Bacon’s arguments on astrology is the Aristotelian principle of cause and effect. He makes references to it several times and also states that the power from the heavens *does* act as a cause influencing the course of the terrestrial world both generally and particularly. In straddling the worlds of philosophy and theology, Bacon must try to bring the two disparate views together for the sake of the salvation of Christianity, validating philosophy while not alienating the religious scholars. His method of doing so is to demonstrate that, with proper understanding, the sacred writers will see that the real practitioners of the science of astrology are completely within the tenets of Christianity.

From these statements, then, it is clear that philosophers do not maintain that there is an inevitable happening of events in all cases due to celestial influences, nor is their judgment infallible in particular instances, but in accordance with the possibility of this science; particularly so since they also add that another science, which is called experimental, gives a still more certain judgment than ordinary astronomy.<sup>149</sup>

This is what allows the astrologers and the sacred writers to come together, “For they [the sacred writers] reprobate nothing except the principle that through the stars a necessity is placed on

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<sup>148</sup>Roger Bacon. *Secretum secretorum*, ed. Steele, 3-4. Quoted in Hackett. 1997, p. 186.

<sup>149</sup>Bacon/Burke (trans.). *Opus maius*, IV, pp. 267-268.

contingent things and particularly on morals and human acts and that there is an infallible judgment in all cases.”<sup>150</sup> Even so, Bacon’s position is interesting because, while he denies infallibility in most cases, he is also very clear that the stars are not only a *cause* of human events and human characteristics, but they are extremely powerful causes which require resistance and awareness which is why it is so important to know about the planets, the stars and their movements. Without an understanding of how the celestial realm can affect the terrestrial realm, human beings are, essentially, at the mercy of causes they do not comprehend. From the moment of conception, a child is affected by the stars indirectly through his mother, and from the moment of birth, he is affected by the stars directly through their effects on the world around him and on the child himself because “what the new jug receives it tastes of when it is old.”<sup>151</sup> This does not indicate absolute determinism but neither does it show an influence which can simply be thrown off without effort. For Bacon, there are parts of life that are caused by the stars. These are generally confined to physical characteristics and inanimate objects, but he clearly goes further than that. In his discussion on the power a skilled astrologer could have in a royal court, he specifically refers to inclinations toward evil bestowed by the stars. It is possible to fight the inclinations, but even so, they are imposed on a specific individual by the stars and their positions and movements at a specific time. At the general level, there is even less distinction between determinism and free will. People who live in a certain area will all be influenced by a specific celestial configuration in much the same way. This is not just in physical characteristics but also extends to their morals and their interests.

In fact, Bacon’s astrology is quite an ingenious system. The rays given off by celestial

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<sup>150</sup>Bacon/Burke (trans.). *Opus maius*, IV, p. 268.

<sup>151</sup>Bacon/Burke (trans.). *Opus maius*, IV.4.5, p. 159.

objects strike the earth. Depending on the angle and the strength of the rays, there will be more or less influence on the terrestrial realm. Everything on the earth receives the rays, from animals to plants to rocks. Human beings are affected by these rays as are inanimate objects. These rays have specific influences both on a general and on a particular level. A person's morals, interests, appearance, vulnerability to illness all are influenced by the rays from the stars and planets. A culture's morals and interests are also affected by the planets and stars. The one thing that cannot be controlled by the stars, however, is the human soul, putting it higher than the stars, although below God and the angels. The question remains as to whether Bacon's astrology is deterministic or not. Certainly, it seems that Bacon would say that it was not. He continually emphasized the freedom of the will. As much power as he assigns to the influence of the stars, they do not force the actions of mankind. They do not remove choices. And yet, the personality, thoughts and physical characteristics of a newborn child are certainly directed by the stars. So much so that the influence from the stars will linger throughout the life of that child, even as the jug will maintain the taste of something placed inside it. If a person is unaware of the influence of the stars, they certainly will push him in a specific direction, even to the point of forcing his actions. That is why Bacon advocates the study of astrology so strongly and why he feels it is necessary for the Church to understand and use it. Living in ignorance of the heavens puts Christianity under the power of the stars. Bacon's defense is focused as much on showing that it is safe and necessary for Christians as it is to explain the details of astrology.





## Chapter 7 Conclusion

Ptolemy's *Tetrabiblos*, Abū Ma'shar's *Kitāb al-Madkhal al-kabīr*, and Roger Bacon's *Opus maius* constitute three important texts in the history of astrology. Each one represents not only a step in the development of astrological defenses, but they also represent three different cultural and religious milieux. Although both Abū Ma'shar and Roger Bacon relied on Ptolemy's defense in the *Tetrabiblos* as a source for their own defenses of astrology, the differences both in their received traditions and in their ultimate intentions in defending the practice contributed to the differences present in their works.

### 7.1 Ptolemy as a Source for Astrology

Ptolemy's prominence as a source of astrology probably owes at least some credit to his reputation as an astronomer. In the Middle Ages, both in the Islamic world and in Europe, Ptolemy's status as a great astronomer did not ebb. His work on astrology built upon the foundation he'd already established in the *Almagest*. While the astrology presented in the *Tetrabiblos* was not comprehensive, the methods he used to defend astrology became the foundation from which later astrologers and advocates of astrology worked. Within the structure of his defense in Book I of the *Tetrabiblos*, he engages in a number of common trends: defining what one is actually practicing, presenting the value of that practice and using such methods as rhetorical questions, analogies and comparisons with other occupations. Ptolemy was coming from a longstanding tradition of defending one's practice as an introduction to a new method of pursuing a science. In the Hippocratic corpus, the rationalizing of medicine brought with it a need to explain how this new approach would allow for a more accurate science. In a similar way, Ptolemy rationalized and removed many of the mythical aspects of astrology in favor of a more theoretical and philosophical foundation. Rather than relate astrological events to the gods

after whom the planets and signs were named, Ptolemy introduced a physical connection between the heavens and the earth. The stars had an influence, some kind of emission which would hit the sublunar sphere and cause changes. Although only briefly, Ptolemy presents an astrology which relies on this physical relation between the heavens and the earth, a “power emanating from the eternal ethereal substance”<sup>1</sup> which comes into contact with the terrestrial sphere and causes various events. The sun “is always in some way affecting everything on the earth” and the moon also “bestows her effluence most abundantly upon mundane things” and the fixed stars and planets “bring about many complicated changes.”<sup>2</sup> Thus, at the heart of Ptolemy’s work is this rationalization of astrology, i.e. giving it a scientific explanation that does not rely on mythical relations or the gods. Ptolemy differed from his predecessors and contemporaries in that he did not continue the tradition of the mythical attributes of the heavenly bodies, choosing instead to take a different, more scientific approach.<sup>3</sup> The stars and planets have a physical connection to the earth and cause things to happen through this link, a far cry from the Mesopotamian *omina* texts in which the gods placed warnings of what was coming for a nation. It also differs substantially from the Stoic astrology of Manilius in which *fata regum orbem* and from the continuation of the mystical and divine origins found in Vettius Valens’ *Anthologiae*.

Ptolemy’s defense contains four parts: a definition of astrology, an explanation of how and why astrology works, the benefits of astrology, and his view of determinism. These four elements form the basis for later defenses of astrology. Ptolemy’s achievement was in changing astrology from a strictly mystical practice to a scientific one. He gave astrology a scientific

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<sup>1</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.2.

<sup>2</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.3.

<sup>3</sup>Riley. 1988, p. 68-69.

explanation and de-mythologized the reasons for astrology's validity. His success in doing so lies in the effect he had on those who came after him. While there were certainly other texts which came after, such as the *Anthologiae* of Vettius Valens and the *Mathesis* of Firmicus Maternus, it was Ptolemy's scientific astrology that took root in later works on astrology. Some of the Christian polemics such as those by Augustine emphasize the more mystical aspects of the practice. In *City of God*, Augustine goes so far as to say that if any astrologer successfully makes a prediction, it is due, not to his skill in reading the stars but the

occult inspiration of spirits not of the best kind, whose care it is to insinuate into the minds of men, and to confirm in them, those false and noxious opinions concerning the fatal influence of the stars, and not to their marking and inspecting of horoscopes, according to some kind of art which in reality has no existence.<sup>4</sup>

In his determination to reject astrology, Augustine places it alongside demonology, linking astrology with mysticism. However, in the pro-astrology works of the later Middle Ages, Ptolemy's scientific astrology becomes the dominant source. His explanation for how astrology works, while not as comprehensive as other astrologers, laid the theoretical groundwork for legitimizing astrology as a science.

However, scholars who flourished after Ptolemy should not be designated as mere copiers. While the defenses contain similar themes and patterns, the two case studies examined here demonstrate that the use of Ptolemy did not amount to a slavish devotion to Greco-Roman science in the Islamic world nor in medieval Europe. Rather, they show a continuation of astrology through two different traditions. Each work was undertaken with a specific intention which differed from that of Ptolemy but used the *Tetrabiblos* as a source. All three scholars wished to defend astrology, but the underlying reasons for their defenses were not the same and

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<sup>4</sup>Augustine of Hippo/Dods (trans.) *City of God*, V.7.

the processes Abū Ma'shar and Roger Bacon followed serve to elucidate their intentions.

## 7.2 Ptolemy and Abū Ma'shar: Originality of the Arguments in *Kitāb al-Madkhal al-kabīr*

Ptolemy's *Tetrabiblos* was one of many scientific works translated into Arabic during the early Abbasid caliphate of the ninth century. The initial push to gain access to Greco-Roman works led to an influx of texts which were incorporated into the further developments made by scholars in the House of Wisdom in Baghdad and elsewhere. Abū Ma'shar grew up in Balkh and later lived Baghdad. First, with his upbringing in a multicultural region wherein he may have had an early introduction to the tenets of astrology and, then, with his life in Baghdad in the midst of the scientific work being done there, Abū Ma'shar was well-situated to incorporate Ptolemy's ideas into his own astrological works, but the added complication of the religious debates going on around him in Baghdad would have prevented him from following Ptolemy's defense to the letter. Although Abū Ma'shar deliberately avoided the religious implications, he would have been aware of them and his place within Islam would have created a very different situation. Rather than a defense of one's practice simply being a tradition, Abū Ma'shar's defense of astrology is an important aspect of justifying his work because of the fact that both religious scholars and philosophers were seeking to condemn the practice and separate it from the more acceptable foreign sciences such as astronomy. Even so, many of the arguments presented by Abū Ma'shar in Book I of *Kitāb al-Madkhal al-kabīr* bear strong resemblance to those posed by Ptolemy in his defense in the *Tetrabiblos*.

That Abū Ma'shar was influenced by the work of Ptolemy seems beyond doubt. As mentioned above, Ptolemy is one of the few scholars referenced specifically in Book I of *Kitāb al-Madkhal al-kabīr* as "Ptolemy the wise," the author of the *Almagest*, although he is not

referenced as a source for Abū Maʿshar's methods of defending astrology. In addition, he is explicitly aware of the *Tetrabiblos* which he mentions in Book V.<sup>5</sup> In fact, the only other scholars mentioned specifically in Book I are "the philosopher," who is undoubtedly Aristotle, Hippocrates, Galen and Hipparchus. However, the similarities in arguments make it certain that Abū Maʿshar was familiar with Ptolemy's *Tetrabiblos* as well as Aristotle and at least some of the Hippocratic/Galenic corpus, all of which had been translated by the time Abū Maʿshar was active.

The question, then, is whether Abū Maʿshar simply used Ptolemy's arguments or if he followed the pattern of appropriation and assimilation presented by Sabra in his article on the naturalization of Greek science, i.e. that he took something Greek and modified it in the context of the Islamic world.<sup>6</sup> Many of the methods used by Ptolemy in defending the practice of astrology can be found in Abū Maʿshar as well, although some arguments are considerably expanded in the *Kitāb al-Madkhal al-kabīr*. At the beginning of his defense, Abū Maʿshar, like Ptolemy, separates the practice of astrology from the practice of astronomy. There was a movement among astronomers in the Islamic world to explicitly separate the two sciences in order to legitimize their own, particularly in later centuries. This was due to the increasing distaste for the science of astrology.<sup>7</sup> Ptolemy's distinction possibly has to do with the need to separate his work on astronomy, the *Almagest*, which he references in the introduction, from his work on astrology, the *Tetrabiblos*, although it also fits into the common practice of using a

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<sup>5</sup>Heilen. 2010, p. 68.

<sup>6</sup>Sabra. 1987.

<sup>7</sup>Saliba. 1992, p. 347.

defense as the introduction.<sup>8</sup> It is also interesting that Ptolemy describes them both as a predictive science. One is used to predict the movement of the stars and planets and one the changes on the Earth, but both are a “means of prognostication.” Abū Maʿshar’s separation is focused on the types of knowledge which come from both, but he also mentions the use of analogies or syllogisms (*qiyāsāt*) in connection with both, saying that astronomy is found by observation but “what is not found visually must be accepted by analogy because the meanings and proofs of it arise from clear evidence” and similarly, astrological knowledge comes from what is perceptible, but what is “imperceptible is shown by clear analogies from the science of the natures of things and what appears from the power of the motions of the planets.”<sup>9</sup> The validity of both sciences should be obvious, but when it is not, the use of analogy proves it beyond doubt with the result that only those who “resist the truth” or who are “distant from knowledge” are able to reject it.<sup>10</sup>

Abū Maʿshar’s use of analogy contrasts with Ptolemy’s method although there are some similarities between the two. Ptolemy compares astrology to other occupations in which the movements of the sun, moon and planets are useful, e.g. farming, navigation, husbandry, as a way of demonstrating that astrology is a valid and useful subject; however, for Ptolemy, astrology is not as reliable as astronomy. It is important and useful but it does not provide as sure knowledge as that which comes from astronomy.<sup>11</sup> In contrast, Abū Maʿshar’s intention is to show that astrology is what makes astronomy worth studying. As he stated in his refutation of the fourth group of critics in section five, the two sciences are connected to each other. The height of

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<sup>8</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.

<sup>9</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.110-113, 122-123.

<sup>10</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.113, 125-126.

<sup>11</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1-2. For more on Ptolemy’s views on astronomy vs. astrology, see also, Burnett. 2002, pp. 199-200.

the celestial spheres and their nobility makes it likely that they have an influence on the sublunar realm.

And they say that it is his duty who looks at the first type of the science (*‘ilm al-kull*) to look after the second type of it (*‘ilm al-nujūm*) because they are related sciences, the one with the other. And the second science is the fruit of the first science because, since he knows the quality of the movements of the spheres and the planets and their quantity, the wise man also knows what the power of those movements show and the states of the things existing in this world. And if he does not know what the planets signify by their movements, then, the first type of the science of the stars has no result and the state of those people who look at the first science, who do not know this science connected to it are as the state of the people who have medications and prepared remedies and they do not know how to use them and those medications and remedies among the treatments are not useful for anything and rejecting illness –

Likewise, those men also know the conditions of the planets and their locations among the constellations and they do not know of anything which each planet shows in its constellation and in its condition. Those [men] produce in their rejection this second type of the science of the stars only they do not apply their minds to it; they reject it because if they confirmed it, the people would find fault with them by their omission of its knowledge, and it is said by them that there are two types of the science, one of them is connected with the other but they present one as better than the other and they do not depict the other in a favorable light.<sup>12</sup>

This quotation shows a different perspective from Ptolemy’s stated position in the *Tetrabiblos*, i.e. that astronomy is “desirable in itself even though it does not attain the result given by its combination with the second” and that astrology never attains the “sureness of the first, unvarying science.”<sup>13</sup> Abū Ma’shar states that, without astrology, astronomy has no purpose and people who study only astronomy have lost all the value in studying the stars and do not understand what benefits they are missing through their rejection. These critics also are so determined to separate astronomy and astrology that they try to make the one better than the other without understanding the connection between them, a reference to the development of the

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<sup>12</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.889-902.

<sup>13</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.1.1.

fledgling science of *‘ilm al-hay’a*, the science of the configuration. Although this new Arabic science was not fully developed in Abū Ma’shar’s day, the ideas behind it were developing in the sciences, particularly with the increasing attacks on astrology. Ptolemy stated that astronomy and astrology are connected, being two types of prognostication via the stars, but Abū Ma’shar’s intention is to make astrology indispensable to astronomy, to the extent that without it, astronomy has no value, unlike Ptolemy’s astronomy which is “desirable in itself.”

Throughout his defense, Abū Ma’shar uses the same analogies as Ptolemy, only greatly expanded, going into detail about how various people use their experiences to predict what will happen in the future in order to show the value of previous experience as opposed to simple observation. Where Ptolemy is content to mention the occupations and explain that they use the movements of the stars and planets to pursue their chosen fields,<sup>14</sup> Abū Ma’shar spends approximately 120 lines elaborating on how many people use general prediction in practice, not necessarily astrology but the general idea of foreknowledge becomes, in itself, an important point to prove. Then, he focuses on medicine specifically for nearly 100 lines, showing how it depends on prediction as well as knowledge of the movements of the stars and planets in order to predict the course of diseases. Ptolemy mentions medicine and its link to astrology,<sup>15</sup> but again, his presentation is much less about specifics and more about a general preliminary sketch of astrology. However, Abū Ma’shar is engaged in a detailed defense of the practice of a science which has been denigrated, and if the *Fihrist* of Ibn al-Nadīm is to be believed, he may have been one who attacked the practice of astrology himself before his introduction to it by al-Kindī.

Another similarity in their defenses is that both take the time to address the problem of

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<sup>14</sup>See, e.g. Ptolemy/Robbins (trans.). *Tetrabiblos*, I.3.13.

<sup>15</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.3.16.



human error and outright fraud in the practice. Ptolemy speaks of those who are simply ignorant and create predictions which are so full of error that they turn those who might have believed away from the art. The other group of those who make errors are the frauds, i.e. the people who “claim credence for another art in the name of this, and deceive the vulgar, because they are reputed to foretell many things, even those that cannot naturally be known beforehand.”<sup>16</sup> Even those who have made a real effort and are trying to practice astrology as it should be practiced may make errors due to its complexity and because, according to Ptolemy, the predictions are not as certain as they are in astronomy.

The arguments are similar for Abū Maʿshar but, again, are not following the same lines exactly. Returning to part 5 and the critics of astrology, the sixth group is made up of those mathematicians who see the errors present in the *zīj*s used in order to make predictions. They present two arguments against astrology. The first is that the estimations used by the astrologers create an error in the locations of the planets and the second is that the different *zīj*s are not in agreement and thus the astrologers cannot make the same prediction if they are relying on a different *zīj*. The errors make the art of astrology false. If astrology is true, it should not create such errors as this. Abū Maʿshar’s rebuttal is also two-fold. First, there are so many different factors involved in making predictions that even though the errors do exist, it does not make the predictions false because the errors are not large enough to put off the locations of the planets by any significant amount.<sup>17</sup> The use of estimation rather than exactitude actually helps the art of

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<sup>16</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.6.

<sup>17</sup>Abū Maʿshar’s rebuttal is also somewhat derisive toward those who create the *zīj*s to the exclusion of all else, since astronomy is confined to the mere collation of data. He has already described astrology as being the highest and noblest of the sciences, but here, he is lifting it even above astronomy, the science of the whole. Saliba (1990) mentioned a tendency of astronomers and philosophers to attack astrology with the idea of separating a questionable practice from their

astrology achieve greater accuracy. Second, the true practitioner of astrology will understand the movements of the stars and will know

thoroughly their effects and what is shown from their natures and properties and [will know] their arrival at the locations in each constellation... If one among them does not know the truth of that, the fault of that ignorance is attributable to that practitioner because he is ignorant of what is necessary for him to teach from his art.<sup>18</sup>

It is to be desired to be as accurate as possible, of course, and Abū Maʿshar advocates the use of instruments to create more accurate tables, but unlike Ptolemy, he does not attribute errors to the uncertainty of astrology itself, only to its general complexity and shortcomings in the practitioners.

Similarly, the tenth group is, like the ninth, made up of members of the general population. The tenth is made up of those who are deceived by false astrologers, who believe that the errors made by them are due to the falsity of the science rather than the ignorance of the practitioners. These are people who see the deceitful practitioners who are “the ignorant of the people and the fallen of the nations and refer their minds to the science of it and they are ignorant of it and they detract their minds from its knowledge” and these people became skeptical because they “read some of the obscure, interesting books which they do not understand or the books whose science they do not trust.”<sup>19</sup> Thus, they do not believe in any of them. “The public blames the people of this art, all of them, and they speak of them with loathing and they accuse them of

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own art, thereby increasing their own acceptability. The attackers listed (see pp. 46-47) all postdate the work of Abū Maʿshar, but perhaps it likely that the attitude was developing even in his time and this counterattack could be Abū Maʿshar’s way of making that division into an asset for astrology.

<sup>18</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.985-988. See also Burnett. 2002, p. 210.

<sup>19</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.1075-1079.

lying; the wise men are afflicted with it from the account of the public.”<sup>20</sup> Abū Ma’shar agrees that the false practitioners should be attacked and rejected but astrology itself is beneficial and should be embraced not rejected. Both Ptolemy and Abū Ma’shar address the errors that arise as natural results of flawed human beings attempting to understand the perfect celestial sphere, and the conclusion, that astrology is still valid and beneficial, remains the same, but their foundational beliefs in astrology lend a different tone to their arguments.

One last point regarding Abū Ma’shar’s originality in his defense of astrology is the extent to which it is an expression of Aristotelian ideas. That “the philosopher” he references in his discussion of the possible in the fifth section of Book I is indeed Aristotle seems beyond doubt, but less obvious is the degree to which he was genuinely using Aristotle’s philosophy rather than simply working from what Lemay describes as “post-classical *compendia* with the resulting promiscuous mixture of pure Aristotelianism with Stoicism and later neo-Platonism.”<sup>21</sup> Certainly, Ptolemy’s defense bears marks of Stoicism (e.g. the benefit of emotional calm) as well as Aristotelianism, and in following his lead, Abū Ma’shar could have been using the same mixed philosophy. Adamson argues that the reliance on *qiyās* as well as Abū Ma’shar’s theological arguments, e.g. giving astrology an exalted status, points to something more than a familiarity with the mixed compendia.<sup>22</sup> However, the greatest similarities, again according to Adamson, are in the works of al-Kindī, the philosopher who, according to Ibn al-Nadīm, first introduced Abū Ma’shar to astrology. Two works of al-Kindī, *On the Explanation of the Proximate, Agent Cause*

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<sup>20</sup>Abū Ma’shar. *Kitāb al-Madkhal al-kabīr*, I.1099-1101.

<sup>21</sup>Lemay. 1962, p. 44. Adamson (2002) and Pingree (1970) both disagree somewhat with Lemay’s emphasis on the Aristotelianism found in *Kitāb al-Madkhal al-kabīr* in part because of his reliance on Latin translations rather than the Arabic original and also because of his dismissal of the influence of the astrological tradition arising in Harrān.

<sup>22</sup>Adamson. 2002, pp. 248, 251-253. See also Lemay. 1962, pp. 48-49.

of *Generation and Corruption* and *On the Explanation of the Bowing of the Outermost Body*, demonstrate the relationship between the two scholars and show that there was a significant influence coming from al-Kindī's interpretation of Aristotelian philosophy.<sup>23</sup> For example, the causal agent used by Abū Ma'shar in the third section of Book I to explain the influence of the celestial bodies on the Earth is that "the outermost sphere surrounds this world and moves with its stars over this world, with an eternal circular motion, so that by its constant moving of the stars, and by their movement over this world, heat is produced in the earthly world" which then begins to move and that movement produces the changes observed in the world.<sup>24</sup> In his *Proximate Agent Cause*, al-Kindī describes the causal agent in a similar way. "The cause producing heat in the elements is from the first element, which moves them through motion in time, place and quality..." and through that heating the four qualities (hot, dry, cold, moist) are affected and change occurs in the world.<sup>25</sup>

Like his predecessors, Abū Ma'shar pursues a course that pulls what he needs from various philosophical ideas, from various scholars and draws them together to create what he sees as a complete defense of his chosen art. He uses the same patterns as Ptolemy does in his defense from defining astrology to the use of analogies to pointing out the benefits of practicing astrology, but the details reflect the culture in which he lives: ninth-century Baghdad, a center of scholarly pursuits as well as the capital of the Abbasid empire. Similarly, Ptolemy lived in the scientific center of Alexandria, and his underlying philosophy reflects an eclectic mix of ideas

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<sup>23</sup>Adamson. 2002, p. 246.

<sup>24</sup>Abū Ma'shar/Adamson (trans.). *Kitāb al-Madkhal al-kabīr*, I.419-424. Quoted in Adamson. 2002, p. 254.

<sup>25</sup>Al-Kindī/Adamson (trans.). *Proximate Agent Cause*, 224.5-18. Page and line numbers refer to al-Kindī/Abū Rīda (ed.). *Rasā'il al-Kindī al-Falsafīyya*, in 2 vols. Quoted in Adamson. 2002, p. 255.

from Neoplatonism to Aristotelianism to elements of Stoicism. Abū Ma'shar's defense rests on the foundation of the Greco-Roman astrology which he inherited. With the access to newly-translated scientific treatises as well as to the original Arabic scientific texts, Abū Ma'shar's defense takes on aspects of a mixture of Muslim and Greek philosophical and astrological doctrines along with his own interpretation of them which creates a defense of astrology which superseded all which came before it.

### 7.3 Bacon and his Predecessors: The Originality of Bacon's Defense of Astrology

As it was in the translation period of the Islamic world, Ptolemy's *Tetrabiblos* was translated into Latin three times over the course of a century, with the first Arabic-Latin translation in 1138. Along with the *Tetrabiblos*, the ps.-Ptolemaic *Centiloquium* had been translated from Arabic by John of Seville, who also translated Abū Ma'shar's *Kitāb al-Madkhal al-kabīr*. Access to works by Ptolemy and Abū Ma'shar was widespread by the time Roger Bacon was writing his *Opus maius*, and Bacon was at least familiar with them. He makes direct references to both scholars and uses them as support for his own presentation of astrology. He also had the benefit of living during the time before the general move away from Arabic sources. By the time of Girolamo Cardano, Ptolemy's *Tetrabiblos* was the main source for classic astrology. Abū Ma'shar's *Kitāb al-Madkhal al-kabīr* had faded, if not to obscurity, at least to a place of lesser prominence in comparison to his Greek predecessor. However, for Bacon, the learning available from the Arabic texts was as valuable as the Greek. Any knowledge that had not been known before was worth studying and evaluating.

Bacon's defense of astrology contains definite similarities to the defenses of both Ptolemy and Abū Ma'shar. The format Bacon uses is very similar to the methods Ptolemy used in the *Tetrabiblos* and by Abū Ma'shar in *Kitāb al-Madkhal al-kabīr*. Bacon is not as concerned as

Ptolemy and Abū Maʿshar were about differentiating between astronomy and astrology. For Bacon, it is much more important to separate astrology from magic and other forms of divination which are prohibited by Christian doctrine, rather than to specify the terminology or show the separation between astronomy and astrology or the links between the two branches. Thus, he devotes space to demonstrating that astrology is part of the “true mathematics” and, once scholars understood the difference between true and false mathematics, “the study of true mathematics was taken up by the Catholic doctors and was continued until the advent of certain theologians who were ignorant of the potency of philosophy and the fallacies of magic.”<sup>26</sup> As remains a running theme throughout the *Opus maius*, Bacon is intent on ridding Christianity of rampant ignorance which, in his view, puts them at a distinct disadvantage in fighting against the pagans, Muslims and heretics who threaten Christianity from all sides. It is ignorance which leads people to reject astrology, but not ignorance alone. Misunderstandings about what astrologers can do with their knowledge also leads to rejection. In this, he explicitly follows Ptolemy’s assertions in the *Tetrabiblos*. Bacon states that the art of astrology is so difficult to master that errors sometimes lead to rejection, but that does not mean that astrology should be rejected, any more than errors in navigation mean that people should avoid sailing.<sup>27</sup> Ptolemy states that it is best to value astrology for what it *can* accomplish, rather than reject it because of what it cannot do. For Bacon, this extends beyond public acceptance or rejection of astrology. In addition to appreciating astrology’s strengths, astrologers themselves need to remember what the limitations of astrology are and not try to go beyond them. By asserting absolute certitude in

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<sup>26</sup>Roger Bacon/Burke. *Opus maius*, IV, p. 269.

<sup>27</sup>Ptolemy/Robbins (trans.). *Tetrabiblos*, I.2.9. See also Roger Bacon/Burke. *Opus maius*, IV, p. 265.

making particular predictions, astrologers move into the area of false mathematics and divination. Bacon's entire discussion of error and skill in making predictions is similar to Ptolemy's presentation in the first three chapters of the *Tetrabiblos* and Abū Ma'shar's in Book I of *Kitāb al-Madkhal al-kabīr*.

Beyond explicit use of the sentiments expressed in Ptolemy's *Tetrabiblos*, Bacon's defense of astrology follows a similar pattern. He takes the time to explain how astrology works, why it is useful, but he has a method of addressing determinism which differs both from Ptolemy's. On the surface, they seem similar. However, determinism and free will are very important topics for Bacon. Unlike Ptolemy, who presents a new process for astrology but does not seem overly concerned about its connection to any religious belief, he has to create a system of astrology which will be accepted by Christianity, and any implication that mankind might be forced into various actions would go against Christian doctrine. From the beginning of the thirteenth century to 1277, there were three condemnations of the scholarship which was being discovered in the Arabic texts newly-translated into Latin. The condemnation of 1277 by Tempier had not yet come about, but the sentiments expressed in Tempier's work are not very different from the earlier condemnations, and the problem of free will is addressed more than once. For Bacon, determinism is one of the most important topics to address. For Ptolemy, it is important to clarify what he sees as misunderstandings and to demonstrate the viability and usefulness of astrology as a branch of the science of prognostication, but he is not concerned with religious condemnation. Ptolemy's approach to determinism is to remove the spiritual and mystical elements of astrology and rationalize its practice. Thus, the heavens are the primary cause of changes on the earth, but they are not the only cause. While the heavenly realm can be predicted absolutely because it is celestial and regular, once the influence from the heavens

reaches the earth, it is no longer perfect. Rather, it is “subject to change, since, of the primary sublunar elements, fire and air are encompassed and changed by the motions in the ether, and in turn encompass and change all else, earth and water and the plants and animals therein.”<sup>28</sup>

Beyond the elements, the terrestrial realm differs from the celestial in that it is changeable, where the celestial realm is not. While the earth does draw “its first causes from above it is governed by chance and natural sequence.”<sup>29</sup>

In contrast, Abū Maʿshar does devote a significant portion of his defense of astrology to addressing the issue of determinism, avoiding the religious debate but still creating a compatibilist approach that reflects the ability of man to choose but restricting his choice based on the determination of the stars.<sup>30</sup> There is an interesting similarity between Bacon’s solution and that of Abū Maʿshar. Bacon does not mention accidents or the changeable nature of the terrestrial realm as a reason for uncertainty. He does use the problem of human error, but his main focus is on the idea that mankind has free will and thus can throw off whatever power the stars may have over him, provided he knows the influence exists. However, he also states that “celestial things are the causes of things below, whence these things that are generated must be known through those that are not generated, namely, celestial things” and these celestial things are not only general causes, “but the proper and particular causes of things below.”<sup>31</sup> Even in human generation, it is the sun which is the ultimate cause, not anything earthly. Abū Maʿshar’s explanation for mankind having free will is found in the fact that an astrologer finds the things

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<sup>28</sup>Ptolemy/Robbins. *Tetrabiblos*, I.2.2.

<sup>29</sup>Ptolemy/Robbins. *Tetrabiblos*, I.3.11.

<sup>30</sup>Abū Maʿshar. *Kitāb al-Madkhal al-kabīr*, I.860-861, 865-866.

<sup>31</sup>Roger Bacon/Burke. *Opus maius*, IV, p. 307.



that exist between necessity and impossibility. Astrology shows the things that are possible, whether they will happen or not. There is no need for astrology to show that things are impossible or are required by nature. The astrologer examines the planets to see if the possibilities will become necessities or impossibilities. Mankind, possessing the rational mind has access to the realm of possibility which is different from animals who act only according to the nature given them by the stars.<sup>32</sup> While Bacon focuses more on the divine nature of man, the end result is the same: Unlike animals and non-living things man has free will and while many things are determined by the power of the planets, his free will is given by God and that cannot be overcome unless he is ignorant of those influences.

This idea leads to a very similar attitude which can be found in both the *Tetrabiblos* and in the *Opus maius*. One of the reasons Bacon considers it so important to use astrology is because of the power the rays which come from the heavens have on the earth and those people and things on the earth. If a man has been influenced to desire something which is wrong, if he does not realize it, if he is ignorant of the configuration of the heavens over his head, he could be pushed into committing sin due to his ignorance, but if he had known about the heavenly influence, he could have made the effort to avoid that weakness.<sup>33</sup> This is almost exactly the same assertion made by Ptolemy in the third chapter of the *Tetrabiblos*. In the case of illness or even of an inanimate object such as a lodestone, “if left to itself through ignorance of the opposing forces, will inevitably develop as its original nature compels, but neither will the sore cause spreading or putrefaction if it receives preventive treatment, nor will the lodestone attract

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<sup>32</sup>Abū Ma‘shar. *Kitāb al-Madkhal al-kabīr*, I.857-872.

<sup>33</sup>Roger Bacon/Burke. *Opus maius*, IV, p. 267.

the iron if it is rubbed with garlic.”<sup>34</sup> In the same way, for human beings, if their future actions are known, they can avoid or ameliorate them, but if they remain in ignorance of the influence of the heavens on them, they will be at the mercy of those forces.

Perhaps even more than the general presentation of his defense, the biggest debt Bacon owes to Ptolemy is the same rationalization of astrology that allowed Abū Maʿshar to situate astrology more securely within the Islamic world. Without the mystical forces and implications of an astrological system such as that espoused by Vettius Valens, Ptolemy’s astrology was more acceptable and easier to justify. “The respect shown Ptolemy’s work by all later astrologers was due, not to its usefulness to the practitioner, but to his magisterial synthesis of astrology and science.”<sup>35</sup> Bacon’s use of Ptolemy as a source is reflected in the continuation of the more scientific astrology, with Bacon going even further in that facet by including extensive discussions of the concept of rays which he took from al-Kindī. Celestial influence is defined as a physical emanation from the heavenly bodies, a concept which also can be seen briefly in the second chapter of the *Tetrabiblos* wherein Ptolemy describes the power of the heavens as “emanating from the eternal ethereal substance” which then “is dispersed through and permeates the whole region about the earth.”<sup>36</sup>

The major difference between Bacon’s astrology and that of Ptolemy and Abū Maʿshar lies in the fact that Bacon’s work is based on a religious foundation. The *Opus maius* was written as a plea to the Pope for a complete change in Christian education. Any recommendation given in the text would have to conform to Catholic doctrine. Thus, even though Bacon relies heavily on

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<sup>34</sup>Ptolemy/Robbins. *Tetrabiblos*, I.3.13.

<sup>35</sup>Riley. 1987, p. 255.

<sup>36</sup>Ptolemy/Robbins. 1940. *Tetrabiblos*, I.2.2.

the tradition of astrology found in Ptolemy's *Tetrabiblos* and in Abū Ma'shar's *Kitāb al-Madkhal al-kabīr*, he cannot follow them completely because of the different cultural and religious milieu found in late medieval Europe. His astrology takes on a distinctly religious tone that is missing from Ptolemy's *Tetrabiblos* and Abū Ma'shar's *Kitāb al-Madkhal al-kabīr* and this creates a defense of astrology focused more on demonstrating the safety of practicing astrology as opposed to simply defending its utility.

#### 7.4 The Continuing Tradition of Defending Astrology

The three defenses examined here demonstrate a continuing tradition which began with Ptolemy's rationalization of astrology and persisted through Abū Ma'shar's work in Baghdad and Roger Bacon's *persuasio* written in a distinctly Christian context. The process of distinguishing astrology from its mythical beginnings and giving it a physical explanation can be seen in all three works, but the manner in which Ptolemy's successors continued his beginning is highly dependent upon their individual milieux. For Bacon, there is a genuine overt effort to demonstrate that astrology is not *dangerous* and indeed is necessary for the preservation of Christianity, whereas for Abū Ma'shar there is a determination to show that it is not *useless* but is a worthwhile practice no matter the situation and is more useful than the astronomy which was more easily-acceptable in medieval Islam. The context in which both men worked, while superficially similar, led to a different method of defending the same practice although using the same foundation. In addition, their individual milieux contributed to the ways in which they adapted the methods they received from Ptolemy. Abū Ma'shar relied on Ptolemy and al-Kindī as well as the cultural influence of his Persian heritage. Roger Bacon, working as a friar within the Franciscan order, was affected by his religious leanings and his need to convince the Pope to follow his suggestions for modifying Christian education. The situations for these two men

separate them from their Ptolemaic source material, and yet, the scientific foundation Ptolemy established gave them firmer ground to stand on in formulating their defenses of a practice in which all of them believed.

From its Greco-Roman beginnings, through Late Antiquity, the medieval Islamic world and medieval Europe, astrology was changed by those who practiced it. It was taken and incorporated into different cultures, different religions. In many cases, other traditions mingled with basic astrology and led to new iterations such as historical and catarchic astrology. However, a common thread can be traced through the centuries beginning with Ptolemy: a new scientific explanation of what astrology is and how it works. The common methods of defending astrology were passed on, but they themselves were modified based on cultural needs. Even the most problematic part of astrology, the issue of determinism, changed as astrology was incorporated into the Islamic and Christian worlds.

After the thirteenth century, moving into the Renaissance period, Abū Ma‘shar’s prevalence as a source for astrology declined. As the translation movement continued, more and more of the ancient Greco-Roman sources were available in their original languages, including Ptolemy’s *Tetrabiblos*, and commentaries on the Latin translation from the Greek were on the rise. Ptolemy’s reputation as an astronomer helped his reputation as an astrologer. Both astronomy and astrology were taught in the universities, the latter particularly attached to medicine, and medical astrology gained in prominence. More research will be needed to clearly lay out the progression of astrology from the Middle Ages through the Renaissance, in particular, how important Ptolemy’s rationalization of astrology was to other later scholars. The nature of the practice, with its often uncertain status in the hierarchy of the sciences, both in the Islamic world and in Christian Europe, led to frequent debates about its validity and what kind of a place

it should have, if any, in various cultures. However, in the two examples of defending astrology I have used, Abū Ma'shar and Roger Bacon, Ptolemy's influence can be seen to have persisted from the second century through to the thirteenth, and the nature of the differences in their defenses illustrates the continuing of the tradition of defending astrology.

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## Appendix 1

Abū Ma‘shar’s *Kitāb al-Madkhal al-kabīr ilā ‘ilm ahkām al-nujūm*  
Book 1, from vol. 2 of the 1995 Lemay edition

A. MA'SHAR

II

KITAB AL-MADKHAL AL-KABIR ILA ILM AHKAM AL-NUJUM

ABŪ MA' ŠAR AL-BALĤĪ

[ALBUMASAR]

كتاب المدخل الكبير إلى علم أحكام النجوم  
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## VOLUME II

[ Tome I. 2ème partie ]

Maqālāt I – V.

*Texte arabe et apparats critiques*

Édition critique par

Richard LEMAY

Emeritus. City University of New York

Publié par les soins de l'

Istituto Universitario Orientale

NAPOLI

1995

بسم الله الرحمن الرحيم  
 [ كتاب المدخل إلى علم أحكام النجوم ]  
 [ لأبي معشر البلخي ]

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1v-6v / الحمد لله الذي خلق السموات بما فيها من عجائبها، وجعل الكواكب زينة ومصابيح  
 ٥ و جعلها دلائل وهداية فيهتدى بها- وجعل الأرض مهاداً وقدر فيها اقوتها- فلا إله  
 إلا الله وحده لا شريك له و صلى الله على محمد النبي عبده و رسوله و على آله سلم  
 كثيراً

- القول الأول من كتاب المدخل إلى علم أحكام النجوم -

هذا كتاب ألفه جعفر بن محمد المعروف بأبي معشر الخراساني البلخي المنجم في  
 ١٠ صناعة المدخل إلى علم أحكام النجوم و هو ثمان مقالات و سنذكر عند كل مقالة  
 عدد فصولها- فامّا الآن فنذكر فصول القول الأول و هي ستة

-الفصل الأول في صدر الكتاب و الرؤوس السبعة-

-الفصل الثاني في وجود الأحكام-

-الفصل الثالث في كيفية فعل الكواكب في هذا العالم -

١٥ -الفصل الرابع في الصور و الطبائع و التركيب و المطبوع-

-الفصل الخامس في الإحتجاج على تثبيت الأحكام و الرد على كل من زعم أن الكواكب لا  
 قوة بحركتها و لا دلالة لها على الأشياء الكائنة في هذا العالم-

-الفصل السادس في منفعة علم الأحكام و أن تقدم المعرفة بالأشياء الكائنة في هذا  
 العالم من قوة حركات الكواكب نافعة جداً-

.....



### - الفصل الأوّل : في صدر الكتاب و الرؤوس السبعة -

قال جعفر بن محمّد المعروف بأبي معشر المنجم : إِنَّ السَّبَبَ الَّذِي دَعَانِي إِلَى تَأْلِيفِ  
 7r كتاب المدخل إلى علم أحكام النجوم أَنِّي رَأَيْتُ الْمُحِبِّينَ لِلْعِلْمِ إِنَّمَا قَصْدُهُمْ لِمَعْرِفَةِ  
 الْأَشْيَاءِ وَ إِسْتِنْبَاطِ / الْعُلُومِ وَ تَأْلِيفِهَا فِإِذْ أَنتَهَيَا لَهُمْ ذَلِكَ فَقَدْ تَمَّتْ بُغْيَتُهُمْ ، لِأَنَّ تَمَامَ  
 عَرَضِ الْعُلَمَاءِ بِتَمَامِ الْمَعْرِفَةِ لِمَا لَهُ يَقْصُدُونَ - وَأَنِّي وَجَدْتُ كُتُبًا كَثِيرَةً قَدْ أَلْفَهَا  
 ٢٥ الْمُتَقَدِّمُونَ مِنْ أَهْلِ صِنَاعَةِ الْأَحْكَامِ وَ لَمْ أَرَ كِتَابًا مُهِمًّا فِيهِ مَعْرِفَةُ هَذِهِ الصَّنَاعَةِ بِالْحُجَجِ  
 الْمَقْنَعَةِ وَ لَا فِيهِ إِبْتِدَاءٌ مَا يَحْتَاجُ إِلَيْهِ النَّازِرُ فِي هَذَا الْعِلْمِ ؛ وَ رَأَيْتُ قَوْمًا قَدْ اِخْتَلَفُوا  
 فِي ذَاتِ الْأَحْكَامِ فَقَالَ قَوْمٌ إِنَّهُ لَيْسَ لِقُوَّةِ حَرَكَاتِ الْكَوَاكِبِ [ فَعَلًا ] فِي هَذَا الْعَالَمِ  
 الْبَيِّنَةُ - وَ قَالَ قَوْمٌ آخَرُونَ أَنَّ لَهَا فَعَلًا فِي الْأَجْنَاسِ وَ الْأَنْوَاعِ وَ الْأَرْكَانِ الْأَرْبَعَةِ ، لَا فِي  
 شَيْءٍ آخَرَ - وَ قَالَ قَوْمٌ أَنَّ لَهَا فَعَلًا فِي إِنْتِقَالِ الزَّمَانِ وَ تَغْيِيرِهِ فَقَطْ - وَ قَالَ قَوْمٌ آخَرُونَ  
 ٣٠ فِي دَفْعَةِ أَقَاوِيلٍ مُخْتَلِفَةٍ أَنَّ لَهَا فَعَلًا فِي كُلِّ شَيْءٍ فِي هَذَا الْعَالَمِ ، وَ هَذَا قَوْلُ أَصْحَابِ  
 صِنَاعَةِ النُّجُومِ - وَ لَمْ أَرَ أَحَدًا مِنْهُمْ أَحْتَجُّ عَلَى قَوْلِهِ بِحُجَّةٍ وَاضِحَةٍ يَقْبَلُهَا الْحُكَمَاءُ فَرَأَيْتُ  
 أَنَّ أَوَّلَ هَذَا الْكِتَابِ فِي الْمَدْخَلِ إِلَى عِلْمِ الْأَحْكَامِ عَلَى نَحْوِ مَا كَانَتْ الْعُلَمَاءُ تَوَلَّفُ  
 كُتُبَهَا فِي شَرْحِ مَا يَحْتَاجُونَ إِلَى مَعْرِفَتِهِ فِي كُتُبِهِمْ وَ تَقْدِيمِ مَا يَنْبَغِي أَنْ يُقَدَّمَ وَ تَأْخِيرِ  
 مَا يَنْبَغِي أَنْ يُؤَخَّرَ - وَ أَنَّ أَوَّلَ مَا فِيهِ بِذِكْرِ الرُّؤُوسِ السَّبْعَةِ الَّتِي كَانَتْ الْحُكَمَاءُ يَبْدَأُ بِهَا  
 ٣٥ فِي كُتُبِهِمْ تَسْبُحًا بِهِمْ وَ سُلُوكًا لِمَسَلِكِهِمْ وَ قَصْدًا لِسَبِيلِهِمْ -

-فَإِنَّمَا أَوَّلُ الرُّؤُوسِ السَّبْعَةِ فَغَرَضُ الْكِتَابِ - وَ الثَّانِي مَنْفَعَتُهُ - وَ الثَّلَاثُ إِسْمُ الْوَاضِعِ  
 لِلْكِتَابِ - وَ الرَّابِعُ إِسْمُ الْكِتَابِ - وَ الْخَامِسُ فِي أَيِّ وَقْتٍ يُقْرَأُ قَبْلَ أَيِّ كِتَابٍ أَوْ بَعْدَ أَيِّ  
 7v كِتَابٍ - وَ السَّادِسُ مِنْ أَيِّ الْأَجْزَاءِ هُوَ : مِنْ جُزْءِ الْعَمَلِ أَوْ مِنْ جُزْءِ الْعِلْمِ - / وَ السَّابِعُ  
 فِي قِسْمَةِ أَجْزَاءِ الْكِتَابِ بِالْمَقَالَاتِ وَ الْفُصُولِ -

٤٠ -فَإِنَّمَا غَرَضُنَا فِي كِتَابِنَا هَذَا بِأَنْ نُبَيِّنَ فِيهِ عِلَّةَ كُلِّ شَيْءٍ يَحْتَاجُ إِلَيْهِ الْمُبْتَدِئُ فِي تَعْلِيمِ  
 أَحْكَامِ النُّجُومِ وَ إِنَّمَا فَعَلْنَا ذَلِكَ لِأَنَّا وَجَدْنَا كُتُبًا كَثِيرَةً قَدْ كَانَ أَلْفَهَا قَوْمٌ مِنْ أَهْلِ هَذِهِ  
 الصَّنَاعَةِ فِي هَذَا الْمَعْنَى فَلَمْ نَرِ لِأَحَدٍ مِنْهُمْ كِتَابًا وَاحِدًا فِيهِ جَمِيعُ مَا يَحْتَاجُ إِلَيْهِ فِي  
 هَذِهِ الصَّنَاعَةِ وَ كَانَ يَظُنُّ كَثِيرٌ مِنَ النَّاسِ أَنَّ أَحْكَامَ النُّجُومِ إِنَّمَا هِيَ شَيْءٌ وَجَدَهُ

الناس حدساً و تخميناً من غير أن يكونَ لها أصل صحيح يعمل عليه أو يقاس به  
 وإِنَّه لا عِلَّةَ لها ولا برهانَ عليها ولا تثبُت على الإحتجاج وأنَّ كلَّ الناس من أهل هذه ٤٥  
 الصناعة تبع للأوائل الذين كانوا في قديم الدهور في كلِّ شئ من هذا العالم وإن  
 لم يكن تقدُّم قول بعض الأوائل على معنى من المعاني فأِنَّه لا يمكن علماء هذه  
 الصناعة أن يستنبطوا علم ذلك الشئ - فألفنا كتابنا هذا في تثبيت الأحكام بالخجج  
 والبراهين المقنعة وبيَّن فيه عِلَّةَ حالات الكواكب والبروج وطبائعها ودلالاتها المفردة  
 والمركبة على الإستقصاء الذي يحتاج إليه في هذا الكتاب - وأنَّ ما كان من علمها غير ٥٥  
 موجود فإنَّ إستنباطه ممكن للعلماء بأصول هذه الصناعة -

فأمَّا منفعة هذا الكتاب فظاهرة بيَّنة لأنَّ كلَّ من يريد أن يتبدئ في تعليم الأحكام  
 فإنَّه يستغني بقراءته و فهمه بهذا الكتاب عن قراءة كلِّ كتاب في المدخل إلى  
 معرفة الأحكام ويستدلَّ بقراءته هذا الكتاب وحده على الأشياء التي لا يستدلَّ عليها ٥٥  
 من قراءة كتاب أحد من المتقدِّمين لأنَّي قد جمعت فيه أصول هذه الصناعة و اظهرت /  
 من أسرار علمها ما كان خفياً على كثير من متقدِّمي علماء هذه الصناعة و كشفت من  
 باطنها ما لا يخفى على أحدٍ ممَّن يقرأوه شئ ممَّا يحتاج إليه من أصول علم الأحكام -

فأمَّا لمن هذا الكتاب فقد ذكرناه في أوَّل كتابنا أَنه لجعفر بن مُحَمَّد المعروف بابي  
 معشر المنجم ؛ وإنَّما إحتاجت الحكماء إلى معرفة إسم الواضع للكتاب لأنَّه إذا علم  
 القارئ له أنَّ واضع الكتاب عالم بمذهب الكتاب ، صادق القول فيه ، قبل قوله و وثق ٦٠  
 بصواب ما يقرأ - وإيضاً فإنَّ الجهال لا تجد كتاباً لا يُعرف صاحبه فينسبونه إلى  
 انفسهم ليأخذوا به ذكراً أو مكسباً -

فأمَّا إسم هذا الكتاب ، فهو كتاب المدخل إلى علم احكام النجوم - و أنما أحتيج إلى  
 إسم الكتاب لأنَّه ربَّما دلَّ إسم الكتاب على غرضه -

٦٥ فأمّا في اي وقت يُقرأ ، قبل اي كتاب او بعد اي كتاب ؟ فأنّه يقرأ قبل كلّ كتاب من كتب الأحكام لأنّه المدخل إلى معرفة علم الأحكام - و إنّما أحتيج إلى معرفة هذا لأنّه ربّما قرأ الإنسان بعض الكتب فلا يفهمه إلّا بأنّ يقرأ قبله كتاباً آخر -

فأمّا من اي جزء هو من أجزاء هذه الصناعة : فهو من جزء العلم ، و إنّما فيه من الجزء العلميّ الشئ الذي يحتاج إليه صاحب المدخل إلى علم الأحكام -

٧٠ فأمّا لِمَ مقالة ينقسم ؟ فأنّه ينقسم لِثَمانِ مقالاتٍ -

٨٧ أمّا المقالة الأولى ففيها ستّة فصول في وجود الأحكام و تثبيتها بقوة حركات الكواكب و كيفية فعلها في هذا / العالم و الردّ على مَنْ قال بإبطالها بالحجج و البراهين المُقنعة و المنفعة بتقدمة معرفة الأشياء من علم النجوم -

٧٥ و أمّا المقالة الثانية ، فإنّ فيها تسعة فصول في عدد صور الفلك و إسمائها و حالات البروج و طبائعها المُفردة -

٨٠ و أمّا المقالة الثالثة فإنّ فيها تسعة فصول في العلّة في استعمال المُنجّمين الكواكب السبعة دون غيرها في الأشياء السريعة التغيّيرات و دلالتها على حالات الأركان الأربعة و تحديد أحكام النجوم و المنجّم في اي شئ ينبغي أن ينظر صاحب علم الأحكام و خاصيّة دلالات الشمس و القمر و مشاركة الكواكب لها على ما يحدث في هذا العالم -

على ما ذكره عامّة الأوّلين و ما كان من ردّنا عليهم قولهم و ما ذكرنا نحن من سعود الكواكب و نحوسها و اختلاف حالاتها و طبائعها -

٨٥ و أمّا المقالة الخامسة فإنّ فيها اثنين و عشرين فصلاً في حظوظ الكواكب في البروج كالأبيوت و الأشراف و الحدود و سائر حظوظها -



والمقالة السادسة فإنّ فيها ثلاثة وثلثين فصلاً في حالات البروج و خاصية دلالاتها على الأشياء -

وأمّا المقالة السابعة فإنّ فيها تسعة فصول في حالات الكواكب و خاصية دلالاتها على الكائنة -

9r ٩٠ و أمّا المقالة الثامنة فإنّ فيها تسعة فصول في إستخراج السهام و عللها - / وإمّا يقسم الكتاب بالمقالات و الفصول لأنّ الكتاب إذا كان فهمه عسيراً، ثمّ فصلّ و جزء كان اقرب إلى فهم القارئ و اسهل عليه -

#### - الفصل الثاني : في وجود علم أحكام النجوم -

٩٥ إنّ في النجوم و حركاتها نوعين من العلم عجيبين في الفكرة عظيمين في القدر - فالنوع الأوّل يقال له علم الكلّ و هو علم كَيْفِيَّة و كميّة الأفلاك العلّيا و أفلاك الكواكب، كلّ فلك على حدّته و بُعد كلّ فلك من صاحبه و ميل بعضها عن بعض و عظمها و قدر كلّ فلك في نفسه و بعده من الأرض - وإنّ الأرض مستديرة وإنّ الأفلاك مستديرة محيطيّة بها وإنّ الفلك الأعلى يدور بذاته و يدير هذه الأفلاك و ما فيها من الكواكب على الأرض في اليوم و الليلة من المشرق إلى المغرب دورة واحدة -

١٠٠ وإنّ الشمس تطلع على قوم دون قوم و إنّه يكون في وقت واحد على قوم نهار و على قوم آخرين ليل - وإنّ الأجرام العلويّة كلّها تتحرّك حركتين ، فأما كثير من الأفلاك فإنّها تسير سيراً موافقاً لسير الفلك الأعلى من المشرق إلى المغرب . و أمّا الكواكب فإنّها تسير من المغرب إلى المشرق مخالفة لسير الفلك / الأعلى و إنّ كثير من الأفلاك يكون سيره موافقاً لسير الكواكب - فقد ذكرنا جميع ذلك في زيجنا الكبير و فيه ذكر أنواع حركات الأفلاك و الكواكب كلّ فلك و كلّ كوكب على حدّته و ما خاصّه كلّ واحد منها و إيّاها أسرع حركة و إيّاها أبطأ و إيّاها أعلى من صاحبه و أنّ

قَدَرَ الْأَرْضَ فِي الصَّغَرِ عِنْدَ الْفَلَكَ الْأَعْلَى كَقَدْرِ النُّقْطَةِ عِنْدَ الدَّائِرَةِ - وَمَعْرِفَةَ كَسُوفِ الْكَوَاكِبِ بَعْضَهَا لِبَعْضٍ وَكَسُوفِ النَّيِّرِينَ فَمَعْرِفَةُ هَذَا وَكُلِّ شَيْءٍ يَحْتَاجُ إِلَيْهِ مِنْ هَذَا الْجِنْسِ مِنْ كَيْفِيَّاتِ الْأَفْلَاقِ وَكَمِّيَّاتِهَا وَكَمِّيَّةِ حَرَكَاتِ الْكَوَاكِبِ وَحَالَاتِهَا، فَهُوَ يَقَالُ لَهُ عِلْمُ الْكُلِّ - فَأَمَّا كَثِيرٌ مِنْ كَيْفِيَّةِ ظَاهِرِ عِلْمِ الْكُلِّ وَكَمِّيَّةِ فَهُوَ مَوْجُودٌ بِالْعَيَانِ، وَمَا لَا يَوْجَدُ مِنْ ذَلِكَ عَيَانًا فَالْقِيَاسُ عَلَيْهِ هُوَ الْمُضْطَرُّ إِلَى قَبُولِهِ لِأَنَّ الدَّلَالَاتِ وَالْبَرَاهِينَ عَلَيْهِ مِنْ أَسْبَابِ بَيِّنَةٍ وَاضِحَةٍ مُتَّفِقَةٍ عَلَيْهَا مِنْ عِلْمِ الْحِسَابِ وَالْهَنْدَسَةِ وَالْمَسَاحَةِ الَّتِي لَا يَخَالُطُهَا شَكٌّ وَلَا تَمْتَنِعُ الْعُقُولُ مِنْ قَبُولِهَا، وَلَا يَدْفَعُ هَذَا الْعِلْمُ إِلَّا مُعَانِدًا لِلْحَقِّ - وَقَدْ أَلَّفَ بِطْلَمَيْوسُ الْحَكِيمُ كِتَابًا يَقَالُ لَهُ كِتَابُ الْمَجَسُطِيِّ فِيهِ جَمِيعُ مَا يَحْتَاجُ إِلَيْهِ مِنْ عِلْمِ حَالَاتِ الْأَفْلَاقِ وَالْكَوَاكِبِ عَلَى الْإِسْتِقْصَاءِ - ١١٥

وَالنُّوعُ الثَّانِي عِلْمُ الْأَحْكَامِ، وَهُوَ مَعْرِفَةُ طَبِيعَةِ كُلِّ كَوْكَبٍ وَكُلِّ فَلَكَ وَخَاصِّيَّةِ دَلَالَاتِهَا وَمَا يَتَوَلَّدُ وَيَحْدُثُ مِنْ قُوَى حَرَكَاتِهَا الْمُخْتَلِفَةِ وَطَبْعِهَا فِي هَذَا الْعَالَمِ الَّذِي هُوَ دُونَ فَلَكَ الْقَمَرِ مِنْ إِخْتِلَافِ الْأَزْمَنَةِ وَتَغْيِيرِ الطَّبَائِعِ الَّتِي هِيَ النَّارُ وَالْهَوَاءُ وَالْمَاءُ وَالْأَرْضُ وَفِي الْأَشْيَاءِ الَّتِي تَحْدُثُ / مِنْ هَذِهِ الطَّبَائِعِ مِنْ أَشْخَاصِ الْحَيَوَانِ وَالنَّبَاتِ وَالْمَعَادِنِ - ١٢٠  
وَبِالنُّوعِ الْأَوَّلِ مِنْ عِلْمِ النُّجُومِ الَّذِي هُوَ عِلْمُ الْكُلِّ يُسْتَدَلُّ عَلَى هَذَا النُّوعِ الثَّانِي الَّذِي هُوَ عِلْمُ أَحْكَامِ النُّجُومِ -

فَأَمَّا كَثِيرٌ مِنْ عِلْمِ الْأَحْكَامِ فَهُوَ ظَاهِرٌ بَيِّنٌ مَوْجُودٌ، وَمَا كَانَ مِنْهُ غَيْرُ ظَاهِرٍ فَأَنَّهُ يُسْتَدَلُّ عَلَيْهِ بِالْقِيَاسَاتِ الْوَاضِحَةِ مِنْ عِلْمِ طَبَائِعِ الْأَشْيَاءِ وَمَا يَظْهَرُ مِنْ قُوَى حَرَكَاتِ الْكَوَاكِبِ عَلَى هَذَا الْعَالَمِ فِي وَقْتِ مُسَامَتَتِهَا بَعْضُ الْمَوَاضِعِ وَبُعْدُهَا عَنِ الْأَرْضِ وَقَرْبُهَا مِنْهَا. وَلَا يَدْفَعُ هَذَا النُّوعُ الثَّانِي مِنْ عِلْمِ النُّجُومِ إِلَّا الْقَوْمَ الَّذِينَ بَعْدُوا عَنِ الْمَعْرِفَةِ وَالتَّمْيِيزِ وَالْفِكْرَةِ فِي حَالَاتِ الْأَجْرَامِ الْعُلَوِّيَّةِ - ١٢٥

فَمِنْ الْقِيَاسَاتِ الَّتِي تَوْجَدُ مَا ذَكَرْنَا مِنْ تَصْحِيحِ الْأَحْكَامِ عَلَى النُّجُومِ أَشْيَاءٌ كَثِيرَةٌ، بَعْضُهَا ظَاهِرَةٌ عِنْدَ الْعَامَّةِ، وَبَعْضُهَا غَيْرُ ظَاهِرَةٍ عِنْدَهُمْ. فَمِنْ الْأَشْيَاءِ الظَّاهِرَةِ الَّتِي تَعْرِفُهَا الْعَامَّةُ بِظَاهَرِ تَجَارِبِهِمْ أَنَّهُمْ يَجِدُونَ الْأَزْمَنَةَ كَالرَّبِيعِ وَالصَّيْفِ وَالْخَرِيفِ وَالشِّتَاءِ إِنَّمَا يَكُونُ يَنْتِقَالُ الشَّمْسُ فِي أَرْبَاعِ الْفَلَكَ وَيَجِدُونَ الطَّبَائِعَ إِنَّمَا تَتَغَيَّرُ ١٣٠

وتنتقل من بعضها إلى بعض ويقوى بعضها و يضعف بعض بالأزمنة و بموافقتها لها  
و بمخالفتها إيها. فإذا كانت الطبائع إنما تتغير بالأزمنة، والأزمنة تتغير بانتقال  
الشمس في أرباع الفلك، فانتقال الطبائع بعضها إلى بعض / إذاً إنما يكون بانتقال  
الشمس في أرباع الفلك - فقد نجد للشمس أيضاً في كل يوم وفي كل وقت فعلاً في  
١٣٥ تغيير الطبائع خلاف فعلها في الوقت الآخر، وذلك لأنها كلما صارت إلى مشرق  
موضع من المواضع أو ارتفعت عليهم أو إنخفضت عنهم، تغيرت طبائعها ومزاجاتها  
و حدث في هواء ذلك الموضع من الحار أو البارد أو الرطب أو اليابس في حيوانها  
و نباتها ومعادنها في كل وقت من اليوم واللييلة من التغيير والكون والفساد شيء من  
الأشياء خلاف ما كان عليه في الوقت الآخر، وذلك كما نرى من ابتداء حركة الناس  
و سائر الحيوان عند بلوغ الشمس إلى مشرقهم فمادامت الشمس صاعدة إلى وسط  
١٤٠ سمائهم فإن حركتهم في زيادة وقوة، فإذا مالت الشمس عن وسط السماء فإن  
حركتهم تضعف و تقل إلى غيبوبة الشمس. فإذا غابت عنهم الشمس، كان الليل  
وهدن فيه الأبدان وسكنت وضعفت وإسترخت للنوم والهدوء فأوت عامة الحيوان  
إلى بيوتها وأحجرتها. فإذا طلعت الشمس عليهم ثانية في اليوم  
١٤٥ الآخر، رجعوا إلى الحال الأولى من الحركة -

وأما النبات فإن فعل الشمس ظاهر فيه لأن كثيراً منه يظهر ويقوى وينمو و يزيد  
فيها عند طلوع الشمس، مثل الريحان الذي يقال له النيلوفل، / والأذريون و الخباز  
وورق الخروع، وأشياء آخر كثيرة من النبات التي تتحرك وتنمو مع حركتها. فإذا  
غابت الشمس، مالت هي وضعفت وإسترخت، وأظهر من هذا من فعل الشمس أن  
١٥٠ الزروع والنبات لا تنمو ولا تنشوا إلا في المواضع التي تطلع عليها الشمس أو  
يُصيبها فيها قوة حرها -

فأما المعادن فإنما يتولد فيها الجواهر على قدر قربها من مدار الشمس أو  
بُعدها عنه، لأن الشمس إذا سامتت موضعاً من المواضع، كان هناك حرّاً، و إذا  
تنحّت عنه، كان هناك برداً - فهذا و كثير من هذا الجنس من ظاهر فعل الشمس قد  
١٥٥ يعرفه العامة -



وقد يُوجَد للقمر أيضاً فعلٌ ظاهرٌ في كثير من الأشياء لأنه كلما تغيّر القمر من حالٍ إلى حالٍ يحدث تغييرات كثيرة في الحيوان و النبات و المعادن و في ماء البحر و في مَسْقَطِ النُطْف و تولّد الحيوان و ابتداء النتاج و اللّقاح ، و يكون ذلك على قدر زيادته في ضوئه و نقصانه منه و سائر اختلاف حالاتها -

١٦٠ و قد يعرف أيضاً كثير من الأمم المُختلفة ما يحدث في أيّام السنة من الحرّ و البَرَد و الرياح و الأمطار و أصناف تغيير الهواء من حلول القمر في كلّ منزلةٍ من المنازل الثمانية و العشرين . و كثير منهم إذا رأوا كلّ واحدٍ من هذه المنازل في المغرب /  
بالغدوات فإنّهم يقولون إنّ الهواء يتغيّر في هذا اليوم بالريح أو بالغيم أو بالحرّ أو بالبرد على قدر ما تقدّمت تجربتهم له - و قد يجْدُ للكواكب كلّها أفاعيل مختلفة في  
١٦٥ هذا العالم إلا أنّ أفاعيلها عند العامّة أخفى من أفاعيل الشمس و القمر -

فمِمّا تستدلّ به العامّة من فعل الكواكب في هذا العالم ما تجْدُ من اختلاف حالات الأزمنة بالكيفية الزائدة أو الناقصة لأنّ اختلافها في الزيادة و النقصان إنّما يكون بمُشاركة الكواكب للشمس و القمر عند حلولهما في بعض مواضع الفلك . و لو لا مُشاركة الكواكب لهما فيه ، لكان لا يكون صيفٌ أحرّ من صيفٍ و لا شتاءٌ أبرد من شتاءٍ .

١٧٠ و قد يجْدُ و يعرف ما ذكرنا من تغيير الطبائع و إنتقالها من حالٍ إلى حالٍ العامّة من جميع الأمم و الأقاليم ممّن لهم تجربة قليلة و يصحّ عندهم من هذه الجهة الظاهرة إنّّ النشوء و الفساد إنّما يكونان على قدر تغيير الأزمنة و الطبائع ، و إنّما تكون تغيير هذه الأشياء بالشمس و بسائر الكواكب - فأمّا القوم الذين تقدّمت تجربتهم و طالت أيّامهم و سنوهم فيها تعلّموا بعض ذلك من أسلافهم فإنّهم حين قاسوا على هذه الأشياء الظاهرة أنّهم وجدوها من فعل الكواكب في الأزمنة و في هذه الطبائع  
١٧٥ من التغير ، عرفوا / منها أشياء غامضة لطيفة -

و قد يعرف الصُّنَاعُ الْمُخْتَلِفُوا الصَّنَاعَاتِ [ أعنى الْمُسْتَعْمِلِينَ لَصَنَاعَاتِ التَّدْبِيرِ وَالْعُلُومِ ]  
 من جميع الْأُمَمِ : مثل أصحاب الزروع و الغرس و رُعاة الدواب و الغنم و سائر  
 الحيوان و مديروا السفن و سائر الصناعات التَّدْبِيرِيَّة كُلِّ وَاحِدٍ من هَؤُلَاءِ يَعْلَمُ من  
 ١٨٠ التَّجَارِبِ اللَّطِيفَةِ بِمَجَارِي الْكَوَاكِبِ أَيَّ الْأَوْقَاتِ و الْأَحْيَانِ أَفْضَلَ و أَيُّهَا ارْدَا لِكُلِّ شَيْءٍ  
 يريدون فعله من إبتداء الزرع و الغرس و إرسال الفحولة لِلنَّتَاجِ و توالد سائر  
 الحيوان -

فَأَمَّا الزَّرَّاعُ فَإِنَّهُمْ يَعْرِفُونَ الْوَقْتَ الَّذِي يَكُونُ فِيهِ الزَّرْعُ أَحْسَنَ نَبَاتًا و أَكْثَرَ رِيعًا  
 و ذِكَاءً فَيَزْرَعُونَ فِي ذَلِكَ الْوَقْتِ - وَأَمَّا أَصْحَابُ الْغَرَسِ فَإِنَّهُمْ يَعْرِفُونَ الْوَقْتَ الَّذِي  
 ١٨٥ يَصْلَحُ فِيهِ غَرَسُ أَصْنَافِ الْغُرُوسِ و الْوَقْتَ الَّذِي لَا يَصْلَحُ فِيهِ ذَلِكَ و كُلِّ نَوْعٍ من  
 الْغَرَسِ فِي أَيِّ زَمَانٍ يَكُونُ أَعْلَقُ و أَجُودُ و أَحْسَنُ نَشْوءًا و أَقْوَى فَيَغْرِسُونَ كُلَّ نَوْعٍ  
 مِنْهُ فِي زَمَانٍ الَّذِي يَصْلَحُ لَهُ -

وَأَمَّا أَصْحَابُ النَّتَاجِ فَإِنَّهُمْ يَعْرِفُونَ الزَّمَانَ الَّذِي يَصْلَحُ فِيهِ إِسْرَالُ الْفَحُولَةِ عَلَى  
 الْأُنَاثِ لِلْمَوَالِيدِ فَيَقْصِدُونَ لِإِسْرَالِهَا فِي الْوَقْتِ الصَّالِحِ لِيَتِمَّ حَمْلُهَا و تَكُونَ وَلَدَتُهَا فِي  
 ١٩٠ وَقْتٍ يَحْسَنُ نَشْؤُهَا و تَرْبِيَّتُهَا -

12v

وَالْمَلَّاحُونَ و مَدِيرُوا السَّفَنِ فَقَدْ يَعْرِفُونَ الْوَقْتَ الَّذِي يَهِيْجُ فِيهِ الْبَحْرُ لِهُبُوبِ الرِّيحِ /  
 و الْأَمْوَاجِ و الْوَقْتَ الَّذِي يَسْكُنُ فِيهِ ، و كُلِّ رِيحٍ فِي أَيِّ وَقْتٍ تَهْبُّ من أَوْقَاتِ السَّنَةِ فَيَمْتَنِعُونَ  
 مِنْ رُكُوبِ الْبَحْرِ فِي الْوَقْتِ الَّذِي يَعْرِفُونَ أَنَّهُ يَهِيْجُ فِيهِ الْبَحْرُ بِالرِّيحِ و الْأَمْوَاجِ الرَّدِيَّةِ  
 و يَرْكَبُونَهُ مِنْ أَوْقَاتِ السَّنَةِ فِي الْوَقْتِ الَّذِي يَعْلَمُونَ أَنَّهُ يَكُونُ الرِّيحُ مَعَهُمْ و لَا يُودِيهِمْ

١٩٥ و كُلِّ هَؤُلَاءِ يَتَقَدَّمُونَ فِي الْقَوْلِ بِمَا يَكُونُ مِنْهُ مِنَ الْجَيِّدِ وَالرَّدِيِّ و يَعْلَمُونَ ذَلِكَ مَنْ لَا يَحْسِنُهُ  
 و لَا يَتَفَقَّهُهُ و لَا عُنِيَ بِهِ مِثْلَ عُنَايَتِهِمْ بِهِ و يَخْبِرُونَ أَنَّهُمْ عَلِمُوا ذَلِكَ بِطُولِ تَفَقُّدِهِمْ  
 و تَجَرُّبَتِهِمْ بِفُصُولِ السَّنَةِ و أَحْوَالِهَا و مَجَارِي الشَّمْسِ و الْقَمَرِ ، و كَوْنِ الْقَمَرِ فِي بَعْضِ  
 الْمَنَازِلِ الثَّمَانِيَةِ و الْعَشْرِينَ و مِنْ قَبْلِ زِيَادَةِ الْقَمَرِ فِي ضَوْئِهِ و نَقْصَانِهِ مِنْهُ و مِنْ تَشْرِيقِ  
 الْكَوَاكِبِ و تَغْرِيْبِهَا فِي ذَلِكَ الْوَقْتِ - وَ قَدْ يَسْتَدَلُّ أَيْضًا كَثِيرٌ مِنْ هَؤُلَاءِ عَلَى أَشْيَاءٍ غَامِضَةٍ  
 ٢٠٠ مِمَّا يَجِدُونَهَا فِي ذَلِكَ الْوَقْتِ مِنْ قَبْلِ هُبُوبِ بَعْضِ الرِّيحِ و تَغْيِيرِ الْهَوَاءِ بِزِيَادَةِ الْحَرِّ أَوْ  
 الْبَرْدِ أَوْ الْإِعْتِدَالِ حَتَّى أَنَّهُ رَبَّمَا قَالَ الرَّاعِي فِي يَوْمِ إِسْرَالِ الْفَحُولَةِ عَلَى الْأُنَاثِ أَنْ صَفَاءَ



13r

الْجَوِّ وَ قُوَّةَ هُبُوبِ الشَّمَالِ ، او من هبوب رِيحٍ أُخْرَى يَدَلُّ عَلَى أَنَّ أَكْثَرَ الْغَنَمِ الَّتِي تَعْلَقُ فِي هَذَا الْيَوْمِ تَلِدُ الذُّكُورَةَ او الْأُنَاثَ و أَنَّ أَكْثَرَ أَلْوَانِهَا تَكُونُ كَذَا وَ كَذَا عَلَى / قَدَرِ مَا تَقَدَّمَتْ مَعْرِفَتُهُمْ بِالتَّجَارِبِ - وَ أَيْضًا فَإِنَّهُمْ عِنْدَ وِلَادَتِهَا يُخَبِّرُونَ بِأَنَّهَا تَسْلَمُ او لَا ، وَيَسْرِعُ نَشْوُئُهَا او يَمُوتُ . وَ رُبَّمَا قَالُوا أَنَّ هَذِهِ أَلْسِنَةُ يَقَعُ الْمَوْتُ فِي جِنْسِ كَذَا وَ كَذَا مِنْ الدُّوَابِّ وَ الْغَنَمِ وَ الْبَقَرِ وَ سَائِرِ الْحَيَوَانِ عَلَى قَدَرِ مَا وَجَدُوا فِي تَجَارِبِهِمْ مِنْ مَجَارِي الْقَمَرِ وَ تَغْيِيرِ الْهَوَاءِ - وَ كَذَلِكَ مَدِيرُوا أَلْسِنَ فَإِنَّ ذَوِي التَّجَارِبِ مِنْهُمْ يَقُولُونَ أَنَّ الرِّيحَ الَّتِي تَهْبُ قَبْلَ زَوَالِ الشَّمْسِ فَإِنَّهَا تَتَغَيَّرُ عِنْدَ زَوَالِ الشَّمْسِ او تَسْكُنُ -

#### - بَابُ فِي حَمْلِ الشَّجَرِ -

وَ كَذَلِكَ أَصْحَابُ الْغَرَسِ فَإِنَّهُمْ يَقُولُونَ فِي أَلْنُوعِ الْوَاحِدِ مِنَ الْغَرَسِ الَّذِي قَدْ غَرَسَ فِي زَمَانٍ وَاحِدٍ أَنَّ هَذِهِ الشَّجَرَةَ تَحْمِلُ أَسْرَعَ مِنْ هَذِهِ او أَبْطَأَ مِنْهَا عَلَى قَدَرِ مَا يَرُونَ فِي كُلِّ وَاحِدٍ مِنْهَا مِنْ الْخَاصِيَّةِ بِطُولِ التَّجَارِبِ - وَ كَذَلِكَ أَهْلُ جَمِيعِ الصَّنَاعَاتِ فَإِنَّ لَهُمْ فِي صُنَاعَاتِهِمْ أَشْيَاءَ لَطِيفَةً قَدْ عَرَفُوهَا بِطُولِ التَّجَارِبِ ، فَلَا يَخْطُونَ فِيهَا وَ يَقُولُونَ أَنَّ الْأَسْبَابَ الَّتِي بِهَا يَعْرِفُونَ هَذِهِ الْأَشْيَاءَ إِنَّمَا هُوَ بِطُولُ تَجَارِبِهِمْ لِتَغْيِيرَاتِ الْهَوَاءِ وَ إِخْتِلَافِهِ وَ مَنَازِلِ الشَّمْسِ وَ الْقَمَرِ -

#### - بَابُ فِي حَمْلِ النِّسَاءِ -

وَ قَدْ يَدْرِكُ النَّاسُ بِالتَّجَارِبِ مِنْ غَيْرِ دَلَالَاتِ النُّجُومِ أَشْيَاءَ كَثِيرَةً أَيْضًا - وَ ذَلِكَ كَالنِّسَاءِ الْقَوَائِلِ فَإِنَّهُمْ يَعْرِفُونَ بِالتَّجَارِبِ هَلْ حَمَلَتِ الْمَرْأَةُ او لَا ، وَ ذَكَرَ الْحَمْلَ او إِنْثَى وَ يَعْرِفُونَ أَيْضًا / مِنْ مَوْلُودِ الْبَكْرِ هَلْ تَلِدُ الْمَرْأَةُ بَعْدَ ذَلِكَ او لَا ، وَ عِدَدَ الَّذِي تَلِدُ ، وَ يَقُلُّ خَطَائِهِمْ فِيمَا يُخَبِّرُونَ بِهِ مِنْ هَذِهِ الْأَشْيَاءِ لَطُولُ تَجَارِبِهِمْ وَ لَكثَرَةُ مَا سَمِعُوا مِنَ الْأَسْلَافِ الَّذِينَ كَانُوا جَرَّبُوا هَذِهِ الْأَشْيَاءَ عَلَى قَدِيمِ الدَّهْرِ - فَأَمَّا مَعْرِفَتُهُمْ بِالْمَرْأَةِ أَحَامِلٌ هِيَ ام لَا فَإِنَّهُمْ يَنْظُرُونَ إِلَى الْمَرْأَةِ الَّتِي يَتَوَهَّمُونَ بِهَا الْحَمْلَ فَإِنْ رَأَوْا رَأْسَ ثَدْيِهَا قَدْ انْبَسَطَ وَ تَغَيَّرَ عَنِ اللَّوْنِ الَّذِي كَانَ عَلَيْهِ ، عَلِمُوا أَنَّهَا حُبْلَى - وَ مِمَّا يَسْتَدِلُّونَ بِهِ أَيْضًا عَلَى الْحَمْلِ أَنَّهُمْ يَنْظُرُونَ إِلَى عَيْنِي تِلْكَ الْمَرْأَةِ ، فَإِنْ رَأَوْهَا قَدْ غَارَتْ وَ كَانَتْ فِي جَفْنِهَا إِسْتِرْخَاءً وَ رَأَوْهَا حَادَّةَ النَّظَرِ صَافِيَةً الْحَدَقَةَ مُمْتَلِئَةً بِيَاضِ الْعَيْنِ غَلِيظَةً ، عَلِمُوا أَنَّهَا حُبْلَى -

13v

- باب في معرفة الذكران والأنث -

فأما معرفتهم بالتذكير و التأنيث فإنهم ينظرون إلى بطن المرأة فإن رآوه مُمتلئاً مستديراً خشناً فيه صلابة و رآوها نقيّة اللون علموا أنّ الحمل ذكرٌ - وإن كان في بطن المرأة طول و إسترخاء و سماجة و ظهر في لونها نَمَش و كَلَف ، علموا أنّ الحمل أنثى - ثم ينظرون بعد ذلك إلى رأس ثدييها فإن كان تغيّرهما إلى السواد علموا أنّ الحمل أنثى ، وإن كان تغيّرهما إلى الحمرة ، علموا أنّ الحمل / ذكر ، إلا أنّ هذه الدلالة الواحدة ربّما تكذبت في الواحدة بعد الواحدة من النساء - و أيضاً فإنه يؤخذ من لبن المرأة الحامل بين الأصبعين و ينظر فإن كان في اللبن غلظ و لزوجة شديدة ، أعلموا أنّ الحمل ذكرٌ - و إن كان ذلك اللبن مسترخياً مائلاً إلى الرقة ، و لا يكون فيه لزوجة ، علموا أنّ الحمل أنثى -

14r

و أيضاً فإنه يُقَطَّرُ من لبن المرأة الحامل على مرآة حديد و يُوضع في الشمس وضعاً رفيقاً كي لا يتحرّك ، ثم يترك ساعة ؛ فإن اجتمع حتى يصير شبه حبة لؤلؤ ، علموا أنّ الحمل ذكرٌ ؛ و إن إنبسط ، علموا أنّها أنثى - فأما معرفتهم بما يكون بعد الولادة فإنه حين تلد المولود و يقع إلى الأرض ينظرون إلى رأسه ، ذكراً كان المولود أو أنثى ، فإن كان على رأسه شبه إكليل من رقة الشعر ، علموا أنّ المولود الذي تلده المرأة بعد ذلك يكون ذكراً أي وقت ولدت بعد سنة أو أكثر - و إن رآوا على رأسه إكليلين ، علموا أنّها تلد بعده غلامين في بطن واحد و يتبرّك بكلّ مولود أو مولودة فيكون على رأسها إكليل في وقت ولادتها -

14v

و ممّا يتبرّك بالمولود أيضاً إن تكون غشاوته / حين تلده أمّه صحيحة لأنّ غشاوة المولود ربّما إنقطعت قبل أن يخرج من بطن أمّه - فأما معرفة عدد الولد الذي تلده المرأة فإنهم ينظرون إلى المرأة البكر إذا ولدت أول ولدها فإذا وقع المولود على الأرض فإنه يكون في طول سرّته المتصلة بالمشيمة تعجير و عقد فينظرون كم فيها من التعجير و العقد فيقولون أنّ تلك المرأة تلد لكلّ تعجير و عقدة في طول تلك السرة ولداً واحداً . و إن لم يروا فيها تعجيراً ، يقولون أنّها لا تلد بعد ذلك شيئاً - و إن كانت المرأة أسقطت بكرها ثم ولدت بعد ذلك فرّبما بطلت هذه الدلالة -



وأيضا فإن لذوي التجارب من رعاة الغنم و أنواع الدواب علامات في كل جنس يعرفون بها حمل ذلك النوع و تذكيره و تأنيثه و ألوانه ؛ و قل ما يخطون فيه . و أما عرف هؤلاء القوم هذه الأشياء لطول تجاربهم فيما هم فيه -

### - علامة في العلل -

٢٥٥ فأما الأطباء فأنهم يعرفون ما يحدث في فصول السنة في أبدان الإنسان من غلبة الحار أو البارد أو الرطب أو اليابس . فأما العلماء الخذاق من الأطباء فأنهم يتقدمون بالقول فيما يكون في كل فصل في أبدان الحيوان من أصناف الأمراض و الحميات و الأورام و اختلاف حال كل علة و مرض من قوته أو ضعفه و زيادته أو نقصانه و طول مكثه أو سرعة ذهابه و سليم هوام غير سليم على قدر ما يرون من اختلاف / هواء البلدان و أسنان

٢٦٠ الحيوان و غلبة بعض الطبائع على الأبدان و يقولون أما يستدل على هذه الأشياء من قبل مزاج السنة و اختلاف الهواء في صلاحه و فساده عند انتقال الزمان و تغيير الطبائع - و هذه الأشياء التي استدل بها الأطباء من اختلاف فصول السنة و هواء البلدان و تغير الطبائع إنما يكون بقوة حركة الكواكب كتسخين قوة الشمس ، و ترطيب قوة القمر و ما يظهر من إفعال الكواكب عند امتزاجها مع الشمس و القمر في كل فصل -

٢٦٥ و الأطباء أعلم ، بالعلل و أسبابها و معرفة الطبائع من أصحاب النتاج و الرعاة و غيرهم فصناعتهم أقرب إلى صناعة النجوم من الصناعات اللاتي ذكرناها قبل ، لأن صناعة الطب إنما هي معرفة طبائع الأركان الأربعة و أبدان الحيوان و النبات و الأحجار و المياه و امتزاجها و خاصيتها و ما يتفق من ذلك و يختلف في البلدان -

و أما صناعة النجوم فأنما هي معرفة ما ينفعل من حركات الكواكب في اختلاف هواء

٢٧٠ البلدان و في حالات أهلها و تغيير الطبائع و إنتقالها من شيء إلى شيء و تركيبها في أشخاص الحيوان و النبات و الجواهر و معرفة قواها في الزيادة و النقصان - فلعلل اللاتي ذكرناها صارت صناعة الطب أقرب إلى صناعة النجوم و أشرف / من الصناعات التي تقدم ذكرنا لها . و إنما عرفت الأطباء طبائع الأشياء و ما فيها من القوى العامة و الخاصة بما يظهر من أفعالها و تغييرها للأبدان ثم نسبوا كل شيء إلى طبيعته التي وجدوها له بالقياس على ما ظهر من قواها و فعلها في الأبدان فقالوا : هذا حار و هذا

٢٧٥

بارد، وهذا رطبٌ وهذا يابسٌ و خاصة كل واحد أن يفعل كذا و كذا- فمن هذه الجهة عرفت الأطباء طبائع العقاقير والأدوية و خاصيتها و طبائع العلل و الأمراض . ثم أخبروا بما يكون و يحدث في كل واحد من ذلك قبل كونه بزمان- و أمّا المنجمون فأنهم عرفوا قوى الكواكب بما يظهر من فعلها في هذا العالم فقالوا : الشمس حارّة لما رأوا من تسخينها ، و القمر رطب لما رأوا من قوة فعله في ماء البحر و سائر المياه ، و كذلك عرفوا قوى سائر الكواكب المتحيرة و الثابتة بالقياس على ما ظهر من قوى حركاتها على هذا العالم ، و أخبروا من هذه الجهة بما يكون و يحدث في هذا العالم من العام و الخاص و استدلتوا على ذلك بقوى حركات الكواكب الفاعلة في الطبائع و المُغيرة لها فكل من ذكرنا من جميع أصحاب هذه الصناعات كالفلاحين و مُدبري السفن و سائر الصناعات / المُختلفة ، فإن صناعتهم جزئية لأنها تستعمل في صناعتها نوعاً واحداً ، و إنّما عرفوا كثيراً من علوم صناعتهم و تديرها بالتجارب بمجاري بعض الكواكب-

16r

#### - باب الأزمنة الصلاح و الفساد -

فأمّا الأطباء و المنجمون فإن صناعتهم كلّية لأنها تستعمل كلّ الأنواع الموجودة و إنّما عرف هؤلاء علم صناعتهم بكنهها بما ظهر لهم من فعل الكواكب في الطبائع ، و فعل الطبائع في الأشخاص المُفردة و بالقياس بما وجدوه على ما غاب عنهم من سببه ، إلا أنّ علم النجوم أشرف و أعلى و أجلّ من علم الطب لأنّ الأطباء إنّما يستدلّون على الصّحة و العلل و الأمراض و حالاتها من قبل الطبائع و تركيبها و إمزاجها و تأليف القوى التي في الحيوان و الشجر و المعادن- فأمّا المنجمون فإنّما يستدلّون على ما يكون و يحدث في هذا العالم بحركات الكواكب و فعلها في هذه الطبائع و تغييرها ٢٩٥ او نقلها إليها من حال إلى حال . فالكواكب بحركاتها علّة لتغيير الطبائع ، و الطبائع تتغيّر بحركات الكواكب و المنجم يستدلّ بالكواكب و بقوى أفاعيلها في الطبائع . و الطبيب يستدلّ بقوى الطبائع و تغييرها و إنتقالها من حال إلى حال و إنّما يكون تغيير الطبائع و إنتقالها بفعل الكواكب فيها . - فصناعة النجوم إذاً أعلى من صناعة الطب و من جميع الصناعات - و ممّا يستدلّ به أيضاً على شرف صناعة النجوم / أنّ صناعة النجوم صناعة علوية و موضعها الكواكب التي لا تتغيّر و لا تقبل الكون و الفساد ٣٠٠ إلى الوقت الذي يشأ الله -

16v



و صناعة الطِّبِّ و سائر أصناعات صناعة أَرْضِيَّة و موضعها الأبدان و الأشخاص الزائلة  
 الْمُتَغَيِّرَةُ الْقَابِلَةُ لِلزِّيَادَةِ و النِّقْصَانِ و الْكُونِ و الْفَسَادِ - فصناعة النجوم إذاً أشرف  
 الصناعات كلها قدرًا و أجلها مُرتَبَةً . فإذا كان علم النجوم كما ذكرنا و كان في ظاهر  
 ٣٠٥ علم حركات الكواكب و معرفة قواها الَّتِي تظهر في هذا العالم ما وصفنا من إستدلال  
 كثير من العامة و الصُّنَّاعِ بِقَلِيلِ تجاربهم و معرفتهم على كثيرٍ مِمَّا هو كائن في  
 جميع هذه الصناعات بما يحدث في كلِّ زمانٍ و فصلٍ من فصول السنة لِشِدَّةِ حرٍّ أو بردٍ  
 أو رطوبةٍ أو يَبُوسَةٍ من قبل إختلاف حركات الكواكب في مَمَرِّها و مسيرها و إنتقالها  
 في أرباع الفلك فيما يَنكِرُ على العالم بحركات الكواكب و طبائعها و طبائع  
 ٣١٠ الزمان مع الكثير التجارب و الَّذِي قد إنتهى إليه مِمَّا جربه العلماء بصناعة النجوم  
 على قديم الدهور و ما إستخرجته العلماء و الفلاسفة بِحِكْمَتِها و علمها و لطيف  
 أفكاره أن يقولَ إذا رأى الزمان مُعتدلاً بحسن المزاج : هذا زمان صَحَّةِ الأبدان  
 و بقاءها و إعتدال طبائعها ، و الدالّ عليه كوكب كذا و كذا - / و إذا كان الزمان غير  
 مُعتدل بغلبة بعض الطبائع عليه أن يقولَ : هذا زمان مرض الأبدان و نقلها و فساده  
 ٣١٥ و ضعف طبائعها ، و الدالّ عليه كوكب كذا و كذا ، ويكون ذلك الكوكب المنسوب إليه  
 ذلك الشئ من الجودة و الرداءة - و هو المعروف عند كلِّ مَنْ تَقَدَّمَ من أهل صناعة  
 النجوم و المُتَّفَقِ عليه عندهم تقديم المعرفة و طول التجارب و ظاهر الدلالة و باطنها  
 أَنَّهُ الدالّ على ذلك الشئ الَّذِي نسبوه إلى ذلك الكوكب من الصَّحَّةِ و المرض أو الخير  
 أو الشرِّ ؛ ثُمَّ ينظر إلى ذلك الكوكب الدالّ على فساد الزمان أو صلاحه فإذا إنفرد  
 ٣٢٠ الدلالة على بعض أشخاص الحيوان و كانت حاله مثل الحال الَّتِي دَلَّت على صلاح  
 الزمان أو فساده أن يقولَ أَنَّ ذلك الشخص يكون حاله كذا و كذا من البقاء أو التلف  
 أو الصلاح أو الفساد ، و يستدلّ على كلِّ حالات ذلك الشخص من الخير أو الشرِّ على  
 قدر ما يستدلّ به على حال الزمان من الإعتدال أو غيره ، لِأَنَّ الكواكب الَّتِي تدلّ على  
 الكلّ و حالاتها تدلّ على جُزْءٍ ذلك الكلّ . فإذا كان الكوكب يدلّ على الزمان و على  
 ٣٢٥ أحواله و ما يكون فيه من الأشخاص و حالاتها فقد يدلّ على الشخص الواحد و على  
 حالاته أيضاً - و لِأَنَّ الأبدان و النفوس و الخلق و الأخلاق و سائر الأشياء تختلف على  
 قدر إختلاف قوى حركات الكواكب في أحوال السنة و في أحوال الزمان و في  
 المكان يترقى من هذا العالم على مثل هذه المراتب إلى أَنَّ يَصِفَ من إختلاف قوى

٣٣٠ حركات الكواكب في الزمان و المكان و في أحوال السنة و من مسقط النطفة / و من إبتداء 17v  
مولد الإنسان خلقه و خلفه و مكانه و غذاءه و نشوءه هو إنتقاله وقوته و ضعفه و شجاعته  
و جبنه و سخاءه و بخله و غير ذلك من حالاته ، و يعرف من مثل هذه الجهة حالات سائر  
الحيوان و النبات و المعادن - ثم يستدلّ بجميع حركات الكواكب على جميع أحوال  
الأشخاص من البقاء أو التلف أو الصلاح أو الفساد أو الجودة أو الرداءة و سائر الأشياء -

٣٣٥ فإذا تقدّمت معرفته بحركات الكواكب و حالاتها ، تقدّم هو أيضاً بالإستدلال على حالات  
الأشخاص . و القول فيها بما يكون من جميع أحوالها قبل كونها بزمان من الأزمنة ،  
فأحكام النجوم إنّما قدر على علمها الأوّلون من مثل هذه الجهة الّتي ذكرنا . فإن  
عرض فيه الخطاء ، فليس ذلك من قبل هذه الصناعة بل إنّما ذلك من تقصير علم كثير  
من أهل النظر في هذه الصناعة عن الإحاطة بعلمها و ضعفهم عن فهم لطائف الأسباب

٣٤٠ و العلل الّتي يقاس عليها بكنهها و قلة حذقهم بتأليف قوى حركات الكواكب و طبائعها  
في إتفاقها و إختلافها في هذا العالم . و ذلك لأنّ صاحب هذه الصناعة يحتاج إلى أن  
يكون عالماً بمجاري الكواكب و مسيرها و حالاتها و درجها و دقائقها من برجها على  
الحقيقة في كلّ وقتٍ يحتاج إليه و بمعرفة طبائع الكواكب و قواها الفاعلة في هذا  
العالم في أحوال السنة و تركيب الطبائع و إتفاقها و إختلافها و طبائع الأشياء و تركيبها

٣٤٥ و إمتزاجها و كيفية النشوء و التوالد / و إختلاف أحوال الحيوان و النبات و المعادن و ما 18r  
يحدث في كلّ واحدٍ منها عند تغير الأزمنة في الأقاليم كلّها و أشياء سنذكرها فيما  
يستقبل . فإن قصّر عن معرفة شيءٍ ممّا ذكرنا أحد من أصحاب هذه الصناعة كان غير كامل  
لما يحتاج إليه في صناعة أحكام النجوم . و لأنّ كثيراً ممّن يستعمل هذه الصناعة لا يقدر  
أن يحيط علماً بهذه الأشياء كلّها للطافتها و غموضها و إختلاف أسبابها و قواها فهم لا  
٣٥٠ يسلمون في بعض الأوقات من الخطاء و الزلل في بعض ما يحتاجون إلى النظر فيه -



- باب علامة في معرفة دلالات الكواكب في معرفة الصواب و الخطاء -

و رُبَّما عجز أيضاً بعض علماء هذه الصناعة في وقت نظرهم في بعض الأشياء إلى أنْ يُبلغوا من حقيقته و الإحاطة به ما لا يخطون فيه لعجزهم في ذلك الوقت عن إستعمال الفكرة في كل شيء يُحتاجون إلى معرفته في ذلك المعنى بعينه و رُبَّما كان ذلك الخطاء لإشتباه دلائله و عسر تمييز بعضها من بعض - وكذلك كل العلوم اللطيفة الغامضة فإنَّه ٣٥٥ رُبَّما عجز كثير من الناس أن يحيط بها علماً و رُبَّما لم يأمن علماءها في بعض الأوقات من الخطاء و الزلل، و خاصَّة إذا كان على مثل ما ذكرنا من علم هذه الصناعة. فإذا كان علم هذه الصناعة و سائر الصناعات التي يحتاج فيها إلى مقدمة المعرفة على ما ذكرنا من الغموض و بعده من الحواس فلا ينبغي أن يبطل ما يدرك من علمها لمكان ما لا يدرك منها و لا يحمل جهل مَنْ جهلها أو حرَّفها عن موضعها / على مَنْ ٣٦٠ علمها صدق عنها و لا يرفض ما قويَّ عليه من ذلك زهداً فيه و إن لم يقدر على أكثر منه، و لا يمنعه ضعفه عمَّا لا يعلم منه من إستعمال ما يعلم منه و لا يصنَّه خوف ما يعرض فيه من الخطاء عند ضعفه عنه أن يستمتع بما يقوى عليه منه فيقضى به حاجته فإنَّ قليل العلم كثير النفع و لا سيَّما مقدمة المعرفة بما هو كائن و علم ماهوات -

18v

٣٦٥ و قد نرى الأطبَّاء و غيرهم من أصحاب الصناعات قد يخطون في مقدمة المعرفة بالأمراض و العلل عند ما يُخبرون به عمَّا يكون و يحدث بالمريض من شدَّة علته أو خفَّته و سرعة برؤه أو طول مرضه و سلامته أو موته و سائر حالات الأمراض ممَّا يحدث فيها و يوؤل إليه حاله منها، و لا يمنع الأطبَّاء قليل خطاءهم من الرغبة في صناعتهم و التزین بها و إستعمالها و لا يشتدَّ إنكار الناس ذلك عليهم و لا يمنعونهم ما رأوا من قليل خطأ هؤلاء في صناعتهم من طلب الإنتفاع بعلاجهم و الإستراحة إلى مداواتهم و السرعة إلى تصديقهم في إخبارهم عمَّا هو كائن من الصلاح و الفساد في أبدانهم بما تقدَّمت لهؤلاء عندهم من المنفعة و الصواب الَّذي كانوا قد عرفوه منهم في قديم الأيَّام بطول التفقُّد و التجارب - و كذلك مُدبرو السفن فإنَّه لا يدع الملاح ملاحته و لا يدع الناس ركوب الماء بقليل خطأ الملاح. و كذلك سائر العلوم ٣٧٥ و الصناعات لا يكاد أهلها يسلمون من عارض خطأ أو حادث آفة / يتهدد لهم و لا يبطل صناعتهم لذلك -

19r

و كلّ من ذكرنا فخطأؤه أكثر ضرراً من خطأ صاحب صناعة النجوم لأنّ الطبيب إذا  
أخطأ في تقدمة معرفة الأمراض و الأدوية و العلاجات فربّما كان خطاءه سبباً لقتل  
الناس و موتهم . وإذا أخطأ الملاح فربّما كان ذلك سبباً لغرق الناس و تلفهم ، وإذا  
٣٨٠ أخطأت الرّعاة و أصحاب النّتايج فربّما كان ذلك داعياً إلى فساد و تلف ذلك الجنس  
من الحيوان ، وإذا أخطأ صاحب الغرس و الزرع فربما كان ذلك سبباً لفساد الزرع  
و الغرس - وإذا أخطأ صاحب صناعة النجوم فإنّما يكون فيه أكثر ذلك أن يجهل صاحبه  
بتقدمة المعرفة بالشئ الذي يحدث و يكون فيدع أن يتقدّم في التحرّز من الأذى  
و المكاره قبل حلولها به فربّما كان تركه للتقدمة في التحرّز داعياً للمكروه و الزائل  
٣٨٥ و ربّما كان فيه التّلف و ربّما لم يكن فيه واحد ممّا ذكرنا و لا يضّر صاحبه ذلك الخطاء -  
فأمّا سائر الصناعات الآخر ففي خطأ أهلها أكثر ذلك التّلف و الفساد و البوار لا محالة -  
فهذا الذي ذكرنا أيضاً من فضيلة صناعة النجوم فإذا كان علم صناعة النجوم أشرف  
هذه الصناعات و سبيل أهله في الخطأ في بعض الأوقات دون سبيل غيرهم من أصحاب  
سائر الصناعات و خطأهم أسلم و أقلّ ضرراً و صوابهم عظيم المنفعة ، فما أحقّ الناس  
٣٩٠ من ذوي التمييز و المعرفة بالقبول و الإستماع منهم و تصديقهم فيما يقولون  
و إستعمالها هذه الصناعة في كلّ شئ يريدون عمله و تقديمه على غيره من العلوم  
و التدابير الدنيويّة و ما أحقّ أصحاب هذه العلم النجوميّ بإستعمال ما أدركوا منه  
و الكفّ عمّا خفيّ عليهم و ترك التّعرّض لما لم يبلغه فهمهم لأنّ أكثر ما يلزم العيب  
علماء هذه الصناعة إنّما هو بسبب قوم جهلة يقصدون بالنظر فيه طلب الكسب و النّيل  
٣٩٥ و الزيادة في الجاه و القدر فيدعون من علم هذه الصناعة ما قصّروا عنه ، و لم يمكنهم  
الإحاطة به و لا طاقة لهم بمعرفته فيجد بهذا السبب كثير من العامّة السبيل إلى دفع  
هذا العلم و التّكذيب به و التّقصير بعلماءه و أهله - و قد يعرض مثل هذا العارض  
الردئ في كلّ صناعات .....



- الفصل الثالث : في علة كيفية فعل الكواكب فيما يكون و يفسد في هذا العالم -

- ٤٠٠ إنَّ كلَّ واضع كتاب يجب عليه أن يُبيِّن معنى كتابه في أوَّل ما يبتدئ به . فأما نحن فإنَّما قصدنا في هذا الكتاب للإخبار عن دلالات الكواكب على الأشياء التي تكون وتفسد في هذا العالم ، ثمَّ نُخَبِّرُ بعد ذلك عن طبائعها وسائر حالاتها . وقد حدَّ الحكيم لنا في معرفة الأشياء حدًّا يجب على كلِّ مَنْ اراد معرفة شئٍ من الأشياء التمسُّك به وهو اربعة . الأوَّل : أن يُعرَفَ / الشئُ المسؤول عنه او المطلوب هل هو موجودٌ او لا - 20r
- ٤٠٥ و الثاني : ما هو - والثالث : كيف هو - والرابع : لِمَ هو . - والأشياء الطبيعية إمَّا تدرك بحاسة من الحواس الخمس التي هي البصر والشم والسمع والذوق واللمس - فأما الكواكب فهي موجودة بحاسة البصر وليس يقدر احد من ذوي التمييز أن يحدَّ وجودها - فأما ماهية الكواكب ، وكلَّ الأوائل من الفلاسفة ممَّن تكلم على الأشياء العلوية متفقون على أنَّ ذاتها من طبيعةٍ خلاف هذه الطبائع الأربع التي هي دون فلك القمر : اعنى النار والهواء والماء والأرض لأنَّها لو كانت من هذه الطبائع الأربع ٤١٠
- للزَّمنها ما يلزم هذه الطبائع من إستحالة بعضها إلى بعضٍ و من الكون والفسد والزيادة والنقصان و لذلك قالت الحكماء أنَّ ذات الفلك و ما فيه من الكواكب من طبيعةٍ خامسة . و أمَّا كيفية الكواكب فإن الفلاسفة ذكرت أنَّها اجرام كُرِّيَّات نيرات متحرَّكات حركة طبيعية . وأمَّا لِمَ هي فليَنفَعِلَ عن حركتها الطبيعية على هذا العالم ٤١٥
- الإستحالات الطبيعية بهذه الأركان الأربعة من بعضها إلى بعضٍ لإتصال هذه الأركان بها بالطبيعة .

- و لذلك قالت الفلاسفة أنَّ العالم الأرضي متَّصل بالعالم السماوي و بحركاته إضطراراً ، فلذلك صار من قوة العالم السماوي و الحركات السماوية تنفعل في هذا العالم الأرضي الأشياء الكائنة و الفاسدة / بإذن الله . و ذلك لأنَّ الفلك الأعلى محيط 20v
- ٤٢٠ بهذا العالم و يتحرَّك على هذا العالم بما فيه من الكواكب حركة مُستديرة دائمة فبتحريكه الدائم للكواكب و بحركة الكواكب على هذا العالم ينفعل في هذا العالم الأرضي المتَّصل بها الحرارة و يحمى ، فإذا حمي هذا العالم لطَفَ و تحرَّك و حدث بحركتها في هذه الأجسام الإستحالات من بعضها إلى بعضٍ و صار فيها الكون والفساد

بإذن الله تعالى - فعلى هذه الجهة يكون للأجرام العلوية فعل وتدير في هذا العالم  
 ٤٢٥ الأرضي وايضاً فلأنه ليس في الحركات حركة تامة ما خلا الحركة المستديرة لأن  
 المتحرك حركة مستديرة لا يمكن ان تسكن لأنه لا ابتداء ولا نهاية لحركته والأشياء  
 التي تتحرك حركة مختلفة غير تامة، لها غاية فإذا إنتهت إلى غاية المكان الذي  
 تتحرك فيه سكنت بعضها منفردة عن بعض إحال غايتها و لأن لحركتها نهاية  
 فبالإضطرار ان يكون لها ابتداء. فلما كانت الأجرام العلوية، اعنى الفلك والكواكب،  
 ٤٣٠ محيطة بهذا العالم و يتحرك على هذا العالم حركة مستوية مستديرة تامة على قصد  
 وترتيب معلوم معروف -

و كانت هذه الأجسام التي دون فلك القمر لها حركتان احدهما مستقيمة غير تامة بها  
 تطلب الغايات والمكان فإذا إنتهت إلى غاياتها سكنت؛ وذلك كحركة النار والهواء إلى  
 21r فوق و كحركة الماء والأرض إلى اسفل. / و الأخرى حركة مستديرة بها تستحيل  
 ٤٣٥ و تنتقل بعضها إلى بعض

فلذلك كانت تلك الأجرام العلوية المحيطة بهذا العالم تتحرك حركة تامة فتتحرك هذه  
 الأجسام الأرضية التي تتحرك حركة مختلفة و صارت علة حركة هذه الأجسام الأرضية  
 من قبل حركة الأجرام السماوية، والقوة التي تصل إلى هذه الأجسام الأرضية هي من  
 قبل تلك الأجرام السماوية و من تحريك الأجرام العلوية للأجسام الأرضية صارت  
 ٤٤٠ الأجسام الأرضية تنتقل وتستحيل بعضها إلى بعض لأن بعضها في بعض بالقوة و بإستحالة  
 بعضها إلى بعض يحدث الكون والفساد في هذا العالم بأذن الله

و قياس ذلك ما نرى من فعل النار فإن النار إذا فعلت بحركتها و خاصيتها في  
 الحطب الإحراق والإحالة من شيء إلى شيء فإنه يفعل من الرطوبة التي في الحطب  
 الدخان لأن الدخان في الحطب بالقوة فبحركة النار فيه يخرج إلى الفعل. و كذلك  
 ٤٤٥ يفعل عن حركات الكواكب في الأركان الأربعة التغير والإنتقال من بعضها إلى بعض،  
 فيحدث منه الكون و الفساد، لأن الكون والفساد في الأركان الأربعة بالقوة  
 فبتحريك الكواكب لها تخرج إلى الفعل.



21v

و كل جسم من الأجسام الأرضية فإمّا يكون فعله في غيره بأحد شيئين : إمّا بالمماسّة  
و إمّا بمتوسّط . فالذي يكون فعله / في غيره بالمماسّة هو كفعل النار في الحطب  
٤٥. الإحراق بمماسّتها إيّاه ، وكفعل الثلج التبريد بمماسّة لبعض الأجسام القابلة للتبريد .  
و الذي يكون فعله في غيره بمتوسّط ، فهو على ثلث جهات : أحدها ما يحدث عن  
فعل الإنسان بإرادته في جسم آخر بمتوسّط يكون بينهما . و هو كتحيكه جسماً من  
الأجسام فيتحرّك عن تحريك الإنسان لذلك الجسم جسم آخر أو أجسام كثيرة . أو  
كرمي الإنسان جسماً من الأجسام منه على بُعد معلوم فيحدث من تحريكه للجسم المرمي  
٤٥٥ به في المرمي فعل من الأفاعيل . فقد حدث عن تحريك الإنسان للشئ المتوسّط الذي  
بينه و بين جسم آخر فعل في ذلك الجسم الآخر البعيد منه . - و الثاني ما يفعل بعض  
الأجسام بطبعه في غيره بمتوسّط قريب ، و هو كفعل النار في الماء التسخين بتوسّط  
الأنية التي يكون فيها الماء . أو كفعل الثلج في الماء التبريد بتوسّط الأنية التي يكون  
فيها الماء . - و الثالث ما يفعل بعض الأجسام بطبعه في غيره بمتوسّط بعيد ، و هو  
٤٦٠ مثل حجر المغناطيس الذي بطبعه يحرك الحديد و يجذبه إليه من بُعد معلوم بتوسّط  
الهواء و لما في ذلك الحجر من الطبع المحرك للحديد و الجذب له و لما في طبع  
الحديد من قبول الحركة من الحجر و / الإنجذاب إليه لإتصاله به بالطبيعة . و قد يحرك  
٢٢r أيضاً هذا الحجر الحديد بسائر الأنواع التي ذكرنا أيضاً لأنّه إذا كان بينهما متوسّط  
قريب ، كالنحاس أو الشبه فإنّه يحركه و يجذبه إليه ، و إذا ماسّه أيضاً ، حرّكه و لصق  
٤٦٥ به و ربّما تحرّك الحديد الذي يلي الحجر للذهاب إليه فحرّك و جذب معه ما إنصل  
به أو قرب منه من جنسه بما صار فيه في ذلك الوقت من قوة طبع ذلك الحجر . و قد  
توجد أشياء كثيرة من الجواهر و العقاقير تفعل بطبعها في غيرها من الأجسام الحركة  
و الجذب إليها عن القرب منها و البعد . -

٤٧٠ فعلى هذا النحو الثالث يكون تحريك الأجرام السماوية للأجسام الأرضية و تغييرها  
إيّاها و إحالتها لبعضها إلى بعض و ذلك لما في الأجرام السماوية من القوة المحركة  
المغيرة المحيطة للأجسام الأرضية و لما في الأجسام الأرضية من قبول الحركة  
و التغيير و الإستحالة من حركة الأجرام العلوية لإتصالها بها بالطبيعة . و إذا كانت بقوة  
حركات الأجرام السماوية تنتقل هذه الأجسام الأرضية بعضها إلى بعض و يحدث فيها

٤٧٥ الكون والفساد، فقد إنفعلت عن حركاتها الطبيعية على هذا العالم في هذه الأركان الأربعة الإستحالات الطبيعية و الكون و الفساد. و إذا إنفعل عن حركاتها الكون والفساد في هذا/العالم، فقد صارت لها الدلالة على ما يكون و يفسد.

22v

٤٨٠ و قد ظنَّ قوم أنَّ المفعول عن غيره و المنفعل عن غيره واحدٌ و أنّه لا ينفعل في الشئ عن غيره الحركة و التغيير و هو منه على بعدٍ معلوم. - و قد غلط هؤلاء لأنَّ الأشياء في هذا المعنى على ثلاث جهات: احدها فعل الشئ، والثاني المفعول عن الشئ، والثالث المنفعل عن الشئ. فأمّا فعل الشئ فهو على جهتين: احدهما بالإرادة، وهو ما يفعل الإنسان بإرادته من الحركة والقيام والعود. والأخرى بطبيعته، وهو كفعل النار الإحراق بطبيعتها لبعض الأجسام القابلة للإحراق. - وأمّا المفعول عن غيره فهو على جهتين أيضاً: احدهما بالإرادة وهو كالحائط المبنى والباب أمانجور والخط المكتوب. فإنَّ هذه مفعولات بحركة الإنسان عن إرادته. والثانية بطبيعته ٤٨٥ و هو كالمحرّق بالنار، فإنَّ المحرّق بها مفعول عن فعلها فيه بطبيعتها. - فأمّا المنفعل عن غيره فهو على خلاف هاتين الجهتين، و هو ما يحدث في الشئ عن غيره من الحركة التغيير و هو منه على بعدٍ معلوم وذلك كإنفعال حمرة الخجل من الحجل و صفرة الفزع من الفزع، و كما ينفعل عن غناء المغنّى الحاذق بالنغم في الإنسان حركة النفس والأعضاء و في العاشق عند رؤيته المعشوق الحركة و الرعدة ٤٩٠ و الدهش و الحيرة، و في المعشوق إذا رأى عاشقه الخجل. و كإنفعال الحركة والإنجذاب في الحديد من حجر المّغنا / طيس فهذا و كثير من هذا الجنس قد ينفعل في كلّ واحد منها عن غيره حركاتٌ مختلفة لإختلاف اسبابها و هو منه على بعدٍ معلوم. ثمَّ تنفعل عن تلك الحركات المختلفة في اشخاص الإنسان كيفية مختلفة على قدر إختلاف تلك الحركات وإختلاف حال الأشخاص القابلات لها-

23r

٤٩٥ فكذاك كلّ كوكبٍ من الكواكب إذا تحرّك على هذا العالم حركةً طبيعيّة فإنّه ينفعل عن حركته الطبيعية في هذه الأركان الأربعة الحركات و التغيير الطبيعيّ إلّذي به تتكيّف و تمازج بعضها بعضٌ بحال يكون من ذلك التكييف و الممازجة في اشخاص الأنواع المختلفة بما في كلّ شخصٍ من الكيفيات المختلفة ممّا ليس في غيره من شخص ذلك



النوع. و إنما يكون إختلاف الأشخاص و كيفياتها على قدر حركة الكواكب على قدر قبول هذه المنفعلات منها. ٥٠٠

و نجعل في ذلك مثالا من الشمس لأنها إذا صارت في الربع الأول من الفلك و سارت فيه لتقطعه ، فإنه ينفعل عن حلولها فيه و حركتها الطبيعية علينا و ما يجذب من سيرها المختلف عندنا ان يتشكل طبيعة ذلك الزمان و الأركان الأربعة بحال يكون فيها أشياء طبيعية مختلفة الأنواع من توريق الشجر ونموها و نبت الأعشاب و الزروع و أنواع كثيرة من الرياحين و ألفواكه و الشجر و الجواهر و الحيوان و كون شيء و فساد شيء ٥٠٥ آخر. و ليس عن إختيار الشمس كان حلولها في هذا الربع و لا كون تلك الأشياء و فسادها ، و لكن لبغها بالحركة الطبيعية إلى هذا الربع ، و من حركتها علينا كان إنفعال هذه الأشياء الطبيعية المختلفة الأنواع. و على هذا النحو يكون إنفعال الأشياء الكائنة و الفاسدة في هذا العالم من حركات الكواكب و من بلوغها إلى كل موضع من مواضع الفلك / بإذن الله. و لأدلل على ان حركة الفلك عن قوة العلة الأولى ، اذكر ٥١٠ قول الفيلسوف ، حيث قال : لَمَّا كان الفلك مُتَحَرِّكًا ، فبإضطرارٍ ان تكون حركته من شيء غير متحرك لأنه إذ كان المُحَرِّك مُتَحَرِّكًا ، لزم ان يكون ذلك إلى ما لا نهاية له . و الفلك دائم الحركة ففوة المحرك له غير ذات نهاية . و إذا كانت قوته غير ذات نهاية ، فليس يمكن ان يكون جسمًا ، بل يجب ان يكون محركًا للأجسام و لأن قوته غير ذات نهاية ، فليس هو إذاً بزائل و لا فاسد . فأنظر كيف ادركنا الخالق المحرك للأشياء ٥١٥ من الأشياء الظاهرة المعروفة المدركة بالحواس ، و أنه ازلي ، ذو قدرة غير ذات نهاية ، و لا متحرك ، و لا مكوّن و لا فاسد : تبارك و تعالى علواً كبيراً .

### الفصل الرابع : في الصور و الطبائع و التركيب و المطبوع

قد ذكرنا فيما تقدّم من كيفية فعل الكواكب في الأشياء التي تكون و تفسد في هذا العالم من هذه الأركان الأربعة و نحن نذكر الآن الصور و الطبائع الأربعة و التركيب الطبيعي و المطبوع - ٥٢٠

- فأقول كالعادة الجارية عند الفلاسفة أنا نسمي الصور الإنسانية التي يقال على كل شخص من الأشخاص الناس، و الفرسية التي يقال على كل فرس من الأفراس، و الحمارية التي يقال على كل حمار من الخمر. وما كان من الأشياء هكذا فأننا / نسمي 24r
- 525 صوراً و نسمي الطبائع الأربعة: النار و الهواء و الماء و الأرض و نسمي التركيب الطبيعي تأليف أجزاء الأشخاص الطبيعية، و تركيب كل شخص على حدته. و نسمي المطبوع ما ينطبع من الطبائع الأربعة من جميع أشخاص الحيوان و النبات و المعادن. فالمطبوعات إذاً، أعني الأشخاص الطبيعية المرئية المحسوسة يوجد فيها أربعة أشياء: أولها وجود ذات المطبوع. و الثاني التركيب - و الثالث الطبائع الأربعة 530 - و الرابع النوع الذي هو منه - فإذا قدّمنا هذه الأشياء التي نحتاج إلى ذكرها فيما يستقبل، فأننا نذكر قول الفيلسوف حيث قال: إن كل معلول، علته أقدم منه بالمرتبة، و المعلول أدنى إلى العلة، و العلة عرفناها بالمعلول - و المطبوع أدنى إلى الطبائع و الطبائع عرفناها بالمطبوع - و كل ما كان حادثاً من شيء فإن الشيء الذي منه حدث أقدم من الحادث و ذلك كالحامل و المحمول: فالحامل الأرض و المحمول الحيوان، 535 فألأرض أقدم من الحيوان بالمرتبة من أجل أن الحيوان محمول، و قد كانت الأرض و لا حيوان فوقها - و كذلك يقال أيضاً أن الطبائع أقدم من المطبوع بالمرتبة و قد كانت الطبائع و لا مطبوع، و كانت أنواع الحيوان و النبات و الجواهر في الطبائع بالقوة إذ لا مطبوع - و لا يكون قوام المطبوع إلا بإعتدال الطبائع و لا قوام الطبائع في المطبوع إلا بإعتدال التركيب و لا يكون تركيب / إلا بمرگب و لا مطبوع إلا بعلّة - و إنه ممّتنع أن 24v
- 540 يكون المرگب هو رگب ذاته، أو يكون المطبوع هو علّة طبع ذاته - و إن كان ذلك كذلك، فلا بدّ من أن يكون علّة طبعت المطبوع من الطبائع و رگبت المرگب و فصلت بين أنواع الحيوان و النبات و الجواهر من الطبائع و الصور - فتيّن الآن أن الله الخالق جعل للكواكب دلالات و حركات طبيعية، و أنه بما ينفعل عن قوى حركاتها الطبيعية في الأركان الأربعة يكون تركيب المطبوعات و تفصيل جميع الأنواع من الطبائع و الصور 545 بما في الأنواع من الفصول - ثم نبين فيما يستقبل أن ما ينفعل فيها عن قوة الشمس هو أقوى على تركيب الأشخاص الطبيعية و تفصيل جميع الأنواع بعضها من بعض و إتفاق النفس الحيوانية و البدن بإذن الله -



أما المطبوعات فهي ما ينطبع من هذه الطبائع الأربعة من جميع الأشخاص و الصور هي التي تترأس على الطبائع وتشكلها إلى جوهريتها و تجتلب و تتخذ من الطبائع أدوات تلائمها حتى يظهر ما في الطبائع بالقوة إلى الفعل فهذا فعل الصور في جميع الحيوان و النبات و المعادن - وكذلك مئلت الفلاسفة لأنها شبهت الصور بالصناع و الطبائع بالأدوات و قالت أن الصور صنّاع خدّاق ، و الطبائع أدوات مختلفة و الصناع مختلفون مثل أكار و حدّاد و صائغ و نجّار ، وليس منهم صانع إلا و أدواته / خلاف أداة الآخر و لا يصلح عمله إلا بأداته التي تلائم صناعته لأنّ الأداة التي تصلح للصائغ خلاف الأداة التي تصلح للنجّار . و ليست تنسب الصناعات إلى الأدوات ، بل إنّما ينسب ذلك إلى الصناع لأنّه ليس من أجل أن النجّار يضطرّ في صناعته أن ينشر بالمنشار و ينحت بالقدوم ينسب الصناعة إلى المنشار و القدوم بل إنّما ينسب الصناعة إلى النجّار - و كذلك الصور مختلفة إنسان و بهيمة و سبع و طائر فألّذي يصلح من الطبائع للإنسان لا يصلح للبهيمة و الّذي يصلح لل سبع لا يصلح للطائر -

فألصور تتخذ من الأدوات ما يلائمها لأنها تتخذ الإنسانيّة [ أعنى النوع ] من الطبائع الحارّة الرطبة و سائرها أدوات لطيفة تصلح لقبول النفس الحيوانيّة و الناطقة و تلائم الإضطجاع و الإنتصاب و الإتكاء و سائر الحركات و يتخذ نوع السبعيّة من الطبائع الحارّة اليابسة و من سائرها أدوات تصلح للبرائن الأنبياب و الخشونة و البطش و القوة - و يتخذ نوع البهيمية من الطبائع الغليظة اليابسة ما يصلح للحوافر و الأظلاف و القوائم ، و يتخذ نوع الطير من الطبائع الخفيفة اللطيفة ما يصلح للريش و الأجنحة و الطيران - و كذلك كلّ نوع منها يستعمل من الطبائع ما يصلح له ، و ليس ينسب ذلك الفعل إلى الطبائع و إنّما / ينسب إلى الصور لأنها هي التي تترأس على الطبائع و يفعل فيها و تتخذ منها ما يلائمها . فلذلك نسبوا الفعل إلى الصور و شبهوها بالصناع و جعلوا الطبائع مثل الأدوات -

و سنذكر الآن خاصيّة الطبائع و الصور لتبيّن لنا ما الّذي يعرض في المطبوع منها - و نعلم أنّ كلّ شئ فيها ممّا ليس هو من خاصيّتها ، فهو ما يفعل في المطبوعات عن قوة حركات الكواكب بإذن الله -

أَمَّا خَوَاصُّ الطَّبَائِعِ الأَرْبَعَةِ المَعْرُوفَةِ ثَلَاثًا - فَالْخَاصَّةُ الأُولَى إِنَّهَا يَضَادُّ بَعْضُهَا بَعْضًا لِأَنَّ  
 الحَرَارَةَ وَالْيَبْسَ الثَّلَاثَانِ فِي النَّارِ تَضَادَّانِ البُرُودَةُ وَالرُّطُوبَةُ الثَّانِيَانِ فِي الْمَاءِ - وَالْخَاصَّةُ  
 ٥٧٥ الثَّانِيَّةُ إِنَّهَا يَسْتَحِيلُ بَعْضُهَا إِلَى بَعْضٍ ، لِأَنَّ الْأَرْضَ إِذَا لَطَفَتْ إِسْتَحَالَتْ فَصَارَتْ مَاءً ،  
 وَالْمَاءَ إِذَا لَطَفَ إِسْتَحَالَ فَصَارَ هَوَاءً ، وَالْهَوَاءَ إِذَا لَطَفَ إِسْتَحَالَ فَصَارَ نَارًا ، وَالنَّارَ  
 إِذَا غَلِظَتْ إِسْتَحَالَتْ فَصَارَتْ هَوَاءً ، وَالْهَوَاءَ إِذَا غَلِظَ إِسْتَحَالَ فَصَارَ مَاءً ، وَالْمَاءَ إِذَا  
 غَلِظَ إِسْتَحَالَ فَصَارَ أَرْضًا - فَالْخَاصَّةُ الثَّالِثَةُ أَنَّهَا تَقْبَلُ الزِّيَادَةَ وَالنَّقْصَانَ لِأَنَّهُ يَكُونُ هَوَاءً  
 أَرْطَبَ مِنْ هَوَاءٍ وَ أَرْضٌ أَيْبَسَ مِنْ أَرْضٍ وَ مَاءٌ أَبْرَدَ مِنْ مَاءٍ وَ حَرَارَةٌ دُونَ حَرَارَةٍ ،  
 ٥٨٠ وَ كُلُّ الطَّبَائِعِ الأَرْبَعَةِ تَقْبَلُ الزِّيَادَةَ وَالنَّقْصَانَ -

وَأَمَّا الصُّورُ ، فَإِنَّ لَهَا ثَلَاثَ خَوَاصٍّ خِلَافَ خَوَاصِّ الطَّبَائِعِ - فَالْخَاصَّةُ الأُولَى إِنَّهَا لَا تَضَادُّ  
 بَعْضُهَا بَعْضًا ، لِأَنَّ الْإِنْسَانَ لَا يَضَادُّ فِي جَوْهَرِيَّتِهِ وَنَطْقِهِ شَيْئًا مِنَ الْأَشْيَاءِ - وَالْخَاصَّةُ  
 الثَّانِيَّةُ أَنَّ لَا يَسْتَحِيلُ بَعْضُهَا إِلَى بَعْضٍ ، لِأَنَّهُ / لَا يَسْتَحِيلُ الْإِنْسَانُ مِنَ الْإِنْسَانِيَّةِ إِلَى غَيْرِهَا -  
 26r وَ الثَّالِثَةُ أَنَّ لَا تَقْبَلُ الزِّيَادَةَ وَالنَّقْصَانَ لِأَنَّهُ لَيْسَ الْإِنْسَانُ فِي الْحَيَاةِ وَ النَّطْقِ بِأَكْثَرِ أَوْ  
 ٥٨٥ أَقَلِّ مِنْ إِنْسَانٍ آخَرَ -

فَهَذِهِ خَوَاصُّ الطَّبَائِعِ وَ الصُّورِ وَ هِيَ كُلُّهَا تَجْتَمِعُ فِي كُلِّ الْمَطْبُوعَاتِ مَعَ أَشْيَاءٍ آخَرَ ،  
 فَكُلُّ شَيْءٍ فِي أَشْخَاصِ الْمَطْبُوعَاتِ مِنْ أَجْلِ الطَّبَائِعِ ، فَهُوَ يَقْبَلُ الزِّيَادَةَ وَالنَّقْصَانَ  
 وَ يَسْتَحِيلُ مِنْ شَيْءٍ إِلَى شَيْءٍ وَ يَضَادُّ بَعْضُهَا بَعْضًا . وَ مَا كَانَ فِيهَا مِنْ أَجْلِ الصُّورَةِ فَأَنَّهُ لَا  
 يَكُونُ فِي شَخْصٍ دُونَ آخَرَ مِنْ نَوْعِهِ ، وَ لَا يَضَادُّ بَعْضُهَا بَعْضًا وَ لَا يَسْتَحِيلُ مِنْ شَيْءٍ إِلَى  
 ٥٩٠ شَيْءٍ وَ لَا يَقْبَلُ الزِّيَادَةَ وَالنَّقْصَانَ ، وَ مَا لَمْ يَكُنْ لِلصُّورَةِ وَ لَا لِلطَّبِيعَةِ فَلَا بُدَّ لَهُ مِنْ عِلَّةٍ  
 وَ عِلَّتُهُ الْقُوَّةُ السَّمَاوِيَّةُ - وَ ذَلِكَ كَالْإِنْسَانِ فَإِنَّ الَّذِي فِيهِ مِنْ خَاصِّيَّةِ الطَّبَائِعِ الأَرْبَعِ أَنَّ  
 يَكُونُ فِي وَقْتٍ حَارًّا وَ فِي وَقْتٍ بَارِدًا ، وَ فِي وَقْتٍ صَحِيحًا وَ فِي وَقْتٍ سَقِيمًا . وَ كُلُّ  
 وَاحِدَةٍ مِنْ هَذِهِ تَضَادُّ الأُخْرَى - وَ الثَّانِيَّةُ الَّتِي يَسْتَحِيلُ بَعْضُهَا إِلَى بَعْضٍ ، أَنَّهُ يَنْتَقِلُ مِنَ  
 الصَّحَّةِ إِلَى السَّقَمِ ، وَ مِنَ السَّقَمِ إِلَى الصَّحَّةِ - وَ الثَّالِثَةُ الَّتِي يَقْبَلُ الزِّيَادَةَ وَالنَّقْصَانَ أَنَّهُ  
 ٥٩٥ قَدْ يَكُونُ الْإِنْسَانُ فِي بَعْضِ الْأَوْقَاتِ أَكْثَرَ أَوْ أَقَلَّ حَرَارَةً مِنْهُ فِي وَقْتٍ آخَرَ - فَهَذِهِ هِيَ  
 الْأَعْرَاضُ الَّتِي تَعْرِضُ فِي الْإِنْسَانِ الْمَطْبُوعِ مِنْ أَجْلِ الطَّبَائِعِ . وَأَمَّا مَا كَانَ فِي الْإِنْسَانِ  
 26v مِنَ الْخَاصَّةِ مِنْ أَجْلِ الصُّورَةِ فَأَنَّهُ لَا يَقْبَلُ الزِّيَادَةَ / وَالنَّقْصَانَ ، لِأَنَّهُ لَيْسَ إِنْسَانٌ فِي الْحَيَاةِ



و النطق و الموت بأكثر أو أقل من إنسان آخر و لا يستحيل من الإنسانية إلى غيرها ،  
و لا يضاد في جوهرية و نطقه شيئاً من الأشياء و هذا ما في الإنسان المطبوع من خواص  
٦٠٠ الصورة و خواص الطبائع -

فأما الذي يفعل فيه من قوى حركات الكواكب بإذن الله مما ليس للطبائع و لا  
للصورة فإن ذلك بين و هو دلالتها على تفصيل نوعه و أشخاصه من سائر الأنواع  
و الأشخاص ، و دلالتها على تركيب كل شخص طبيعي و إمتزاج الصورة و الطبائع في  
المطبوعات و إتفاق النفس الحيوانية و الناطقة مع البدن و أشياء آخر مثل حسن الصورة  
٦٠٥ و قبحها و الطول و القصر و التذكير و التأنيث و الألوان و الحركة و الشجاعة و الجبن  
و حسن الخلق و السمن و الهزال و الغلظ و الرقة و سائر ما يشبه هذا - فقد ظهر لنا  
أنه قد إجتمع في الشخص الواحد الأشياء الأربعة لأنه شخص من أشخاص النوع  
الذي هو منه و مركب من الطبائع الأربعة . و تبين لنا ما في كل شخص من خاصية  
الطبائع و خاصية الصور ، و ما فيه مما يفعل عن قوى الكواكب بإذن الله ، و أن كل  
٦١٠ شئ ينطبع من هذه الطبائع الأربعة و تفصيل جميع الأنواع و الأشخاص من الطبائع و الصور  
و تركيب / الأشخاص الطبيعية بكيفياتها المختلفة و إتفاق النفس الحيوانية و الناطقة  
الناطق في البدن و سائر حالاتها إنما هو عن ما يدل عليه قوة حركات الكواكب بما  
جعل لها الخالق البارئ من الحركات التي تنفعل عن قواها هذه الأشياء -

و الكواكب السبعة كلها بإتفاق حالاتها و إختلافها تشترك في الدلالة على حالات كل  
شخص في هذا العالم ، صغر ذلك الشخص أو كبر إلا أن لبعضها في بعض الأجناس أو  
٦١٥ الأنواع أو الأشخاص من الدلالة أكثر مما للكواكب الآخر - و ذلك كدلالة الشمس على  
الحياة الجنسية التي هي لكل حيوان متنفس نام منتقل ، و دلالة عطارد على نوع الناس  
- فإذا كان لكوكب من الكواكب الدلالة العامة على شئ من الأشياء ، ثم تم دلالة  
على ذلك الشئ في بعض الأشخاص إشتراك هو بعد ذلك مع باقي الكواكب في الدلالة  
٦٢٠ على تمام أجزاء ذلك الشخص - و ذلك كالأشخاص الواحد من الناس الذي تمت  
الشمس دلالتها الحيوانية فيه بالحياة الجنسية التي له ، ثم تم عطارد دلالة النوعية  
فيه بالإنسانية و النطق اللذين له ، ثم إشتراكهما و الكواكب بالدلالة في تمام أعضائه

وكيفياته فللشمس من شخص الإنسان الدلالة المنفردة على الحياة العامية التي هي الجنس والدلالة على الدماغ والقلب بمشاركتها للكواكب ولعطارد الدلالة المنفردة ٦٢٥  
بالإنسانية التي هي النوع، والدلالة على اللسان والفم بمشاركته للكواكب ولزحل  
دلالة على الطحال، وللمشترى دلالة / على الكبد، وللمريخ دلالة على الدم والزهرة  
دلالة على الكليتين ومجرى المني، وللقمر دلالة على المعدة - وكذلك يكون دلالة  
كل واحد منها على جزء من أجزاء البدن حتى يتم جميع أجزائه

27v

فربما صار للكوكب الواحد الدلالة على عدة أجزاء من أجزاء شخص الإنسان بكيفياتها ٦٣٠  
لإشتراكها كلها فيه على النحو الذي وصفنا، ويصير لكل عضو مكان من البدن وطبيعة  
وفعل وحال ليست لغيره من الأعضاء، وكذلك الأترنجة الواحدة: لها شكل ولها  
جلد ولحم وحمض وحب، ولحبها قشران وفي جوف ذلك الحب حب آخر، ولكل  
واحد منها طبيعة وخاصية فعل وبعض الكواكب دلالة الريحان الذي هو جنسه  
ولآخر دلالة الأترنجة التي هو نوعها، ثم يشترك بعد ذلك كلها في الدلالة في أجزائها  
٦٣٥ فيكون لبعضها دلالة الجلد وبعضها دلالة اللحم حتى يتم دلالتها كلها في تمام  
أجزائها بكيفياتها بإشتراكها كلها فيها. وكذلك ألياقوتة الواحدة: لها طبيعة وكمية و  
شكل ولون وصفاء وفيها إنما أشد صلابة وإسترخاء من جوهر آخر من جنسها ولها  
خاصية فعل فلبعض الكواكب دلالة الجوهر الذي هو جنسها ولآخر دلالة نوع  
ألياقوت ولوكوب آخر دلالة شيء من الأشياء حتى يتم أجزاؤها بإشتراك / الكواكب فيها

28r

٦٤٠ ولولا اشتراك دلالات أكواب كلها في الشخص الواحد لكان لا يكون له أجزاء وكيفيات  
وحالات مختلفة وليست هذه الأجزاء بكيفياتها إنما يكون جزء بعد جزء ويكون  
إشتراكها فيها مرة بعد مرة ولكنّها تشترك كلها في الدلالة على أجزاء الشخص  
الواحد وكيفياته وحالاته دفعة واحدة - وكذلك كل شخص من أشخاص الحيوان  
والنبات والمعادن ليكون لبعض الكواكب فيه دلالة الجنس، ولآخر دلالة النوع، ثم  
٦٤٥ يشتركان هما والكواكب كلها بعد ذلك في الدلالة على تمام أجزائها بكيفياتها-



و هيّ وأن أشرتكت كلها في الدلالة على الشخص الواحد فأنّ لكل واحد منها من خاصيّة الدلالة على كلّ واحد من أشخاص النوع الواحد خلاف ما له من الدلالة على الشخص الآخر، و ذلك لإختلاف حالاتها و قوتها و ضعفها في كلّ وقت من الأوقات و لإختلاف حال هذه الأركان القابلات لقواها -

٦٥. فلهذه العلّة نرى الغالب على بعض الأشخاص خلطا من الإخلاط و يرى لكل شخص كيفيات و خاصيّات ليست لغيره من الأشخاص التي من نوعه، و كلّ الأشخاص الطبيعيّة إنّما تترکب من الأركان الأربعة على أحدي جهتين : أحديهما من إستحالة الموات التي من جنسه فلينفعل منها عند / إستحالتها شيء آخر. و ذلك كإنفعال الإنسان من النطفة و السنبلة من حبة الحنطة و الشجرة من غصن من أغصان الشجر الذي هو من جنسه - ٦٥٥ و الأخرى كإنفعال بعض الحيوان و النبات و الجواهر من الأركان الأربعة، لا من شيء آخر مثله - و ذلك كالأعشاب و كثير من النبات و الأشجار فأنّها تكون من غير شيء آخر من جنسه. و الجواهر المعدنيّة تكون من البخارات المختلفة، لا من شيء مثلاً -

و كثير من الحيوان في البرّ و البحر كالذباب و البقّ و البعوض و الديدان و الضفادع و أنواع كثيرة من السمك و حيوان الماء و الحيات التي توجد في شجر الخلاف ٦٦٠ بين اللحاء و الخشب و بعض العقارب و حرشة الأرض و الحيوان الطيار قد يكون في بعض أوقات السنة من الأركان الأربعة من غير توالد - و في هذه الجهة الثانية الردّ على من قال أنّه لا يكون شيء إلّا من شيء من جنسه، و دليل على أنّ ذلك إنّما يكون بتقدير العزيز العليم و تدبيره -

### - الفصل الخامس -

٦٦٥ في الإحتجاج على تثبيت الأحكام و الردّ على مَنْ زعم أنّ الكواكب لا قوة لحركتها  
ولا دلالة لها على الأشياء الكائنة في هذا العالم

29r

/إنّ قوماً ردّوا علم أحكام النجوم - و هم عشرة أصناف:

#### الصنف الأوّل

٦٧٠ فأمّا الصنف الأوّل فقالوا أنّ الكواكب لا دلالة لها على شيء ممّا يكون و يفسد في هذا  
العالم الذي دون فلك القمر - فقلنا أنّ كلّ الحكماء متفقون على أنّ كلّ جوهر يتحرّك  
حركة طبيعيّة فأنّه يفعل عن حركته الطبيعيّة في غيره من الأشياء المتّصلة به بالطبيعة  
الإستحالات الطبيعيّات . و إذا إنفعل عن حركته الطبيعيّة في غيره من الأشياء المتّصلة به  
بالطبيعة الإستحالات الطبيعيّات فالمتحرّك علّة لتلك الإستحالات و هي معلولة منه -

و القياس على ذلك ما يوجد من حركة النار : فأنّه يفعل عل خاصّيّتها و حركتها الطبيعيّة  
٦٧٥ في الأشياء المتّصلة بها بالطبيعة الإستحالات الطبيعيّات ، أعنى الإحراق ، فالنار علّة  
لِحرق الأشياء التي تحترق بها . و الأشياء المحترقة معلولة منها - و أشياء كثيرة موجودة  
من هذا الجنس . فذلك هذه الأجرام السماويّة إذ هي طبيعيّة الحركة على هذا  
العالم ، فأنّه يفعل عن حركتها الطبيعيّة في هذه الأركان الأربعة المتّصلة بها  
بالطبيعة الإستحالات من بعضها إلى بعض ، و عند إستحالة أحدهما إلى الآخر يكون

29v

٦٨٠ الكون و الفساد بإذن الله - فيصير إذا إستحالة بعضها إلى بعض و الكون و الفساد  
الذي يكون / منها معلولا من الأجرام العلويّة المتحرّكة ، و تكون هي علّة لها و حركتها  
التي للكون ، هي التي للفساد ، إلاّ أنّها من جهة الكون محمودّة ، و من جهة الفساد  
مذمومة - و ذلك كالخشب الذي يحترق فيصير فحماً فهو و إن فسد عن طبيعة الخشب  
بحركة النار فيه فإنّ بتلك الحركة صار كون الفحم لأنّ فساد شيء من الأشياء ، هو كون  
٦٨٥ شيء آخر - فلذلك قال عامّة قديماء الفلاسفة أنّه يفعل عن حركات الكواكب الطبيعيّة  
الدائمة الكون الطبيعيّ الدائم إلى الوقت الذي يشاء الله -

- الصنف الثاني -

وَأَمَّا الصنف الثاني فَأَنَّهُمْ ذَكَرُوا أَنَّ لِلْكَوَاكِبِ دَلَالَاتٍ عَلَى الْأَشْيَاءِ الْكَلِّيَّةِ كَالْأَرْكَانِ  
الْأَرْبَعَةِ الَّتِي هِيَ النَّارُ وَالْهَوَاءُ وَالْمَاءُ وَالْأَرْضُ وَعَلَى إِسْتِحَالَةِ بَعْضِهَا إِلَى بَعْضٍ ، وَعَلَى  
٦٩٠ الْأَجْنَاسِ وَالْأَنْوَاعِ الْكَلِّيَّةِ كَدَلَالَتِهَا فِي مَعْنَى الْجِنْسِ عَلَى الْحَيِّ الْعَامِّيِّ الَّذِي يَقَالُ  
عَلَى كُلِّ جِسْمٍ مِنَ الْأَجْسَامِ الَّذِي لَهُ الْحَيَوَةُ ، أَوْ كَمَا يَدُلُّ فِي مَعْنَى النَّوعِ عَلَى الْإِنْسَانِ  
وَالْفَرَسِ وَالْحِمَارِ وَسَائِرِ الْأَنْوَاعِ الْعَامِّيَّةِ - فزَعَمُوا أَنَّهَا إِنَّمَا تَدُلُّ عَلَى الْأَرْكَانِ  
الْأَرْبَعَةِ وَإِسْتِحَالَةِ بَعْضِهَا إِلَى بَعْضٍ وَإِنْتِقَالِهَا مِنْ حَالٍ إِلَى حَالٍ وَعَلَى الْأَجْنَاسِ  
وَالْأَنْوَاعِ الْكَلِّيَّةِ وَأَنَّمَا تَدُلُّ / عَلَى الْأَشْخَاصِ الْوَحْدَانِيَّاتِ الَّتِي تَكُونُ مِنْ هَذِهِ الْأَرْكَانِ  
٦٩٥ الْأَرْبَعَةِ كَسَعِيدٍ وَخَالِدٍ وَفَرَسٍ وَاحِدٍ وَحِمَارٍ وَاحِدٍ وَلَا تَدُلُّ عَلَى أَجْزَاءِ الْأَشْخَاصِ أَيْضًا  
كَالرَّأْسِ وَالْيَدِ وَالرِّجْلِ وَسَائِرِ الْأَعْضَاءِ وَلَا عَلَى حَالَاتِهَا كَالْقِيَامِ وَالْقُعُودِ وَالْمَرَضِ  
وَالصَّحَّةِ وَسَائِرِ الْحَالَاتِ الْمُخْتَلِفَةِ الْكَلِّيَّةِ وَالْجُزْئِيَّةِ الَّتِي لِكُلِّ شَخْصٍ مِنْ أَشْخَاصِ  
الْعَالَمِ -

فَرَدَدْنَا عَلَيْهِمْ قَوْلَهُمْ بِخُجَّتَيْنِ: أَحَدُهُمَا أَنَّ الْأَصْلَ الْمُتَّفَقَ عَلَيْهِ عِنْدَ الْفَلَّاسِفَةِ أَنَّ كُلَّ  
٧٠٠ شَخْصٍ فِي هَذَا الْعَالَمِ مِنَ الْأَشْخَاصِ الطَّبِيعِيَّةِ هُوَ مُرَكَّبٌ مِنَ الْأَرْكَانِ الْأَرْبَعَةِ الَّتِي هِيَ  
النَّارُ وَالْهَوَاءُ وَالْمَاءُ وَالْأَرْضُ لِأَنَّ هَذِهِ الْأَرْكَانَ مَوْجُودَةٌ فِي كُلِّ شَخْصٍ فِي هَذَا  
الْعَالَمِ - فَأَنَّ الْبَارِيَّ جَعَلَ الْأَجْنَاسَ وَالْأَنْوَاعَ هِيَ الْفَاعِلَةُ فِي هَذِهِ الْأَرْكَانِ بِعِلَّةِ حَرَكَاتِ  
الْكَوَاكِبِ عَلَيْهَا لِأَنَّ كُلَّ شَخْصٍ يَكُونُ أَوْ يَفْسُدُ فِي هَذَا الْعَالَمِ فَإِنَّمَا يَكُونُ بِحَرَكَةِ  
الْأَرْكَانِ وَانْتِقَالِ بَعْضِهَا إِلَى بَعْضٍ وَعَنْ حَرَكَةِ الشَّمْسِ وَالْكَوَاكِبِ عَلَيْهَا تَنْفَعَلُ فِيهَا تِلْكَ  
٧٠٥ الْحَرَكَةُ الَّتِي هِيَ الْإِنْتِقَالُ وَالْإِسْتِحَالَةُ . فَالْكَوَاكِبُ إِذَا هِيَ عِلَّةُ لِحَرَكَاتِ هَذِهِ الْأَرْكَانِ  
وَالْإِسْتِحَالَةِ بَعْضِهَا إِلَى بَعْضٍ . وَلَهَا الدَّلَالَةُ عَلَى الْأَجْنَاسِ وَالْأَنْوَاعِ كَمَا زَعَمُوا - فَإِذَا  
عِلَّةُ الْكُونِ وَالْفَسَادِ الَّذِينَ يَكُونَانِ مِنْ هَذِهِ الْأَرْكَانِ بِإِذْنِ اللَّهِ - وَلِأَنَّ الْجِنْسَ وَالنَّوعَ  
وَالْأَرْكَانَ الْأَرْبَعَةَ وَالْكَوَاكِبَ وَالْفَسَادَ مَوْجُودٌ فِي كُلِّ شَخْصٍ مِنَ الْأَشْخَاصِ وَالْكَوَاكِبِ  
دَالَّةٌ عَلَى الْأَجْنَاسِ وَالْأَنْوَاعِ / وَعَلَى الْأَرْكَانِ الْأَرْبَعَةِ وَإِسْتِحَالَةِ بَعْضِهَا إِلَى بَعْضٍ وَعَلَى  
٧١٠ الْحَرَكَاتِ الَّتِي هِيَ إِبْتِدَاءُ الْكُونِ وَالْفَسَادِ فَالْكَوَاكِبُ إِذَا دَالَّةٌ عَلَى الْأَشْخَاصِ  
الْمُفْرَدَةِ . وَإِنْ دَلَّتْ عَلَى الْأَشْخَاصِ الْمُفْرَدَةِ فَهِيَ دَالَّةٌ عَلَى أَجْزَاءِ الْأَشْخَاصِ وَعَلَى  
حَالَاتِهَا أَيْضًا -



وَالْحُجَّةُ الثَّانِيَّةُ أَنَّ الْكَلِّيَّاتِ إِنَّمَا يَقَالُ لَهَا كَلِّيَّاتٍ بِأَجْزَائِهَا، وَالأجزاء إِنَّمَا هِيَ أَجْزَاءُ لِلْكَلِّ. وَالشَّخْصُ الْوَاحِدُ إِنَّمَا هُوَ جُزْءٌ مِنْ أَجْزَاءِ كُلِّ النُّوعِ، وَالنُّوعُ إِنَّمَا هُوَ نَوْعٌ بِالأَشْخَاصِ الْمَفْرَدَةِ الَّتِي تَحْتَهُ فَإِنْ كَانَتْ الْكَوَاكِبُ تَدَلُّ عَلَى النُّوعِ فَهِيَ أَيْضًا تَدَلُّ عَلَى الشَّخْصِ الْوَاحِدِ الَّذِي لَذَلِكَ النُّوعِ لِأَنَّهَا إِذَا دَلَّتْ عَلَى نَوْعِ الْإِنْسَانِ الْكَلِّيِّ الَّذِي يَقَالُ عَلَى كُلِّ شَخْصٍ مِنْ أَشْخَاصِ النَّاسِ وَ عَلَى نَوْعِ الْفَرَسِ الَّذِي يَقَالُ عَلَى كُلِّ وَاحِدٍ مِنَ الْأَفْرَاسِ، فَهِيَ أَيْضًا تَدَلُّ عَلَى الْأَشْخَاصِ الْوَاحِدَانِيَّاتِ (التي هِيَ إِنْسَانٌ وَاحِدٌ) كَسَعِيدٍ وَخَالِدٍ وَفَرَسٍ وَاحِدٍ وَإِذَا دَلَّتْ عَلَى الْأَشْخَاصِ الْمَفْرَدَةِ فَهِيَ تَدَلُّ إِذَا عَلَى الْأَجْزَاءِ تِلْكَ ٧١٥  
٧٢٠. الْأَشْخَاصِ الَّتِي هِيَ الرَّأْسُ وَالْيَدُ وَالرَّجْلُ وَعَلَى كَيْفِيَّاتِهَا الَّتِي هِيَ الْبَيَاضُ وَالسَّوَادُ وَغَيْرَهُمَا مِنَ الْكَيْفِيَّاتِ وَعَلَى حَالَاتِهَا الَّتِي هِيَ الْمَرَضُ وَالصَّحَّةُ وَالْقِيَامُ وَالْقُعُودُ وَسَائِرُ الْحَالَاتِ - فَالْكَوَكِبُ إِذْنُ لَهَا الدَّلَالَةُ عَلَى الْأَشْخَاصِ الْمَفْرَدَةِ وَ عَلَى أَجْزَاءِ الْأَشْخَاصِ وَ عَلَى كَيْفِيَّاتِهَا وَحَالَاتِهَا الْكَلِّيَّةِ وَالْجُزْئِيَّةِ.

#### - الصنف الثالث -

٧٢٥ وَأَمَّا الصَّنْفُ الثَّلَاثُ فَهَمُ قَوْمٌ مِنْ أَهْلِ الْحَدِيثِ وَالنَّظَرِ رَدُّوا عِلْمَ / أَحْكَامِ النُّجُومِ وَقَالُوا  
31r أَنَّ الْكَوَكِبَ لَا دَلَالََةَ لَهَا عَلَى شَيْءٍ مِمَّا يَكُونُ فِي هَذَا الْعَالَمِ وَاحْتِاجُوا عَلَى ذَلِكَ بِأَن قَالُوا أَنَّ النُّجُومَ لَا تَدَلُّ عَلَى الْمُمْكِنِ - فَنَذَكِرُ الْآنَ حُجَجَ بَعْضِ الْأَوَّلِينَ الَّذِينَ دَفَعُوا الْمُمْكِنَ. ثُمَّ نَبَّهْتُ الْمُمْكِنَ. ثُمَّ بَيَّنَّ أَنَّ الْكَوَكِبَ تَدَلُّ عَلَى الْمُمْكِنِ -

٧٣٠ إِنَّ الْقَوْمَ الَّذِينَ دَفَعُوا أَحْكَامَ النُّجُومِ لِعِلَّةِ الْمُمْكِنِ إِحْتَجُّوا بِأَن قَالُوا أَنَّ الْفِيلَسُوفَ  
ذَكَرَ أَنَّ أَحْوََالَ الْأَشْيَاءِ فِي الْعَالَمِ ثَلَاثَةٌ: وَاجِبٌ، كَالنَّارِ حَارَّةٌ؛ وَمُمْتَنِعٌ، كَالْإِنْسَانِ يَطِيرُ؛ وَمُمْكِنٌ، كَالْإِنْسَانِ كَاتِبٌ وَالنُّجُومُ إِنَّمَا تَدَلُّ عَلَى غُنُصْرَيْنِ: الْوَجِبِ وَالْمُمْتَنِعِ فَأَمَّا الْمُمْكِنُ فَإِنَّهَا لَا تَدَلُّ عَلَيْهِ، فَصَنَاعَةُ النُّجُومِ بَاطِلَةٌ -

٧٣٥ فَأَمَّا قَوْمٌ مِنْ أَصْحَابِ النُّجُومِ وَكَثِيرٌ مِنَ الْمُتَفَلِّسِينَ الْأَوَّلِينَ الَّذِينَ كَانُوا يُنَبِّتُونَ دَلَالَاتِ  
النُّجُومِ عَلَى الْأَشْيَاءِ الْكَائِنَةِ فِي هَذَا الْعَالَمِ تَثْبِيثًا وَاجِبًا فَأَنَّهُمْ لَمَّا وَرَدَتْ عَلَيْهِمْ هَذِهِ الْمَسْئَلَةُ الْعَوِيصَةُ وَعَجَزُوا عَنْ الْجَوَابِ فِيهَا رَدُّوا الْمُمْكِنَ وَقَالُوا أَنَّ الْعُنَاصِرَ إِنَّمَا هِيَ

إثنان: الواجب و الممتنع فقط. لأننا إنمّا نعرف شيئين نعم او لا و معناهما الوجود و العدم. فأمّا نعم فإنّها تدلّ على الوجود، و أمّا لا، فإنّها تدلّ على العدم - و الوجود هو العنصر الواجب، و العدم، هو العنصر الممتنع. و هذه تسمّى القضية المتناقضة، لأنّه إذا صدق جزء واحد كذب الجزء الآخر و لا يمكن أن يصدق جميعاً في شيء واحد في وقتٍ / واحد - و ذلك كالرجلين قال أحدهما: غداً يكون مطر، و قال الآخر: غداً لا

31v

يكون مطر. فلا بُدّ من أن يصدق أحدهما، و هو الواجب؛ و يكذب الآخر، و هو الممتنع - و كذلك إذا قال قائل في يومنا هذا أنّه يحدث غداً شيء من الأشياء فإذا حدث ذلك الشيء في غدٍ، فإنمّا حدث لأنّ حدوثه كان واجباً. و إن قال لا يحدث، فلم يحدث، فإنمّا لم يحدث لأنّ حدوثه كان ممتنعاً، و إذا صدق أحدهما، كذب الآخر - و كذلك إن

قال فلان: يمشي، فمشى، فإنمّا مشى لأنّه كان واجباً أن يمشي؛ فإن قال: لا يمشي فلم يمش، فإنمّا لم يمش لأنّه كان ممتنعاً أن يمشي - و قالوا أنّ الناس مُجبّرون على أفاعيلهم للأشياء فإذا فعلوا شيئاً فإنمّا فعلوه لأنهم مجبّرون على فعلهم ذلك، و هو الواجب؛ و إن لم يفعلوه فإنمّا امتنعوا من فعله لأنّه ممتنع أن يفعلوه - فكلّ شيء يكون فكونه واجبٌ و الَّذي لا يكون فهو ممتنع أن يكون، و ليس يدلّ النجوم إلّا عليهما، و أنّه لا ممكن البتّة -

فنقض الفيلسوف قولهم و ثبتّ الممكن بحجج كثيرة. ثمّ ذكر بعد ذلك أنّ الممكن يؤول إلى الواجب او إلى الممتنع - فالحجّة الأولى في تشييته للممكن أنّه قال أنّ الواجبة و الممتنعة معروفة في الأوقات الثلاثة بالموجب او الإمتناع بطبيعتهما؛ فأمّا أفاعيلنا فهيّ خلاف ذلك لأنها ممكنة،

و ذلك كمعرفتنا بالشمس أنّها كانت مضيئة في الزمان الماضي و هيّ مضيئة الآن، و تكون مضيئة فيما يستقبل و كمعرفتنا/ بالنار أنّها كانت حارّة، و هيّ حارّة الآن و تكون حارّة. و كذلك إن قلنا أنّ النار و الهواء و الماء و الأرض كما هيّ الآن، و كذلك كانت

32r

و كذلك تكون فقد يُعلم أنّه صدق في الأوقات الثلاثة، و هذا هو العنصر الواجب - فأمّا العنصر الممتنع فكقولنا: الإنسان كان طائراً، و الإنسان يطير الآن، و ممكن أن يطير فيما يستقبل و كذلك إن قلنا أنّ النار كانت باردة و هيّ باردة و تكون باردة. فإنّ ذلك معروف أنّه ممتنع في الأوقات الثلاثة و هو كذب - فقد صار الواجب و الممتنع معروفين في الأوقات الثلاثة بالموجب او الممتنع بطبيعتها. و أما أفاعيلنا فإنّها ليست كذلك لأنّ



الإنسان إن قال : كنت فيما سلف فاعلاً للخير ، و أنا الآن فاعلاً للخير ، فأنه لا يقدر أن يقول : أنا فيما إستقبل أفعل الخير لا محالة لأنه لا يدرى ا يمكنه ذلك ام لا ، فإذن لا يعلم الإنسان ما يريد أن يفعله علماً لا شك فيه ، فليست هذه إضطراراً ، بل هي ممكنة . - فالممكن موجود -

و الحجة الثانية أنه قال أن الواجب و الممتنع كل واحد منهما في جميع النوع بالسوية ، و الممكن ليس بمستوى فيه . و ذلك أن الحياة موجودة في جميع الناس بالإستواء ، و الحرارة مستوية في كل النار لا يقبل شئ منها الزيادة و النقصان و كذلك جميع الممتنعة بعدها مستوى عن جميع أهل النوع لأن جميع الناس يقال فيهم بالسوية إنهم لا / يطيرون ، و أن النار غير باردة فأما الأفاعيل فليست كذلك لأن في نوع الناس من يعمل الخير و منهم من يعمل الشر ، و منهم من يكون عمله للخير او للشر أكثر من عمله للآخر و إن كانت جميع الواجب لاحقة بأهل النوع كلهم على الإستواء و الممتنعة بعيدة من جميع أهل النوع كلهم على الإستواء و هما لا يتغيران و أفاعيلنا ليست بمستوية في النوع بل هي متغيرة من الخير إلى الشر و من الشر إلى الخير في وقت بعد وقت و من القلة إلى الكثرة و من الكثرة إلى القلة ، و هي تقبل الزيادة و النقصان - فهي إذن ممكنة . فالممكن موجود -

و الحجة الثالثة في وجود الإمكان إن الإنسان إنما يتفكر و يستشير فيما فيه الإمكان . كالأرجل إذا أراد أن يبني بنياناً تفكر في كيفية ما يريد أن يبنيه و إستشار فيه فإذا صحت عزمته على البناء ، تفكر و إختار أي يوم يبتدى فيه و إذا أراد أن يسافر ، إستشار ا يسافر ام لا و هل السفر في البر خير له او في البحر . فإذا صحت عزمته على السفر ، ففكر و إستشار في اي يوم يسافر . ثم يسافر في اليوم الذي يريده - و إذا أراد أن يزرع تفكر و إستشار فيما يريد من الزراعة و في الموضع الذي يزرع فيه . ثم إختار ما يريد مما تفكر فيه و أشير به عليه و إذا أراد ضحية إنسان تفكر و إستشار اي الناس خير له ، ثم إختار الذي يريد . -



33r

وكذلك يفعل في الأشياء الجزئية . كالأشياء التي يتفكر و يقول : أي شيء أكل اليوم او  
 أي شيء أشرب او أي ثوب ألبس او في أي مجلس أقعد . / و إذا كان صحيح الجوارح  
 والحواس يقول : أنظر إلى فلان او لا ، او أكلت فلاناً او لا - فهذا وأشياء من هذا  
 الجنس يمكن فيه الاختيار وكل هذه الممكنات أولها يقوم في الفكر و آخرها  
 ٧٩٠ يؤول إلى فعله او تركه . فأما الواجب والممتنع فإنهما يوجدان في الأشياء وجوداً  
 طبيعياً في الفكرة فقط لأن الإنسان بالفكرة يعلم أن الحياة واجبة للإنسان الحي وأنه  
 ممتنع أن يطير . و لو كانت الأشياء إمّا واجبة و إمّا ممتنعة فقط و الواجب و الممتنع  
 من الإضرار لم يحتج الناس إلى فكر و لا إلى مشورة و كانت تكون الفكرة والمشورة  
 في اختيار شيء من شيء آخر باطلاً لأنه لا يمكن الإنسان أن يتفكر فكرة صواب او  
 ٧٩٥ يستشير غيره في النار ا تحرق ام لا تحرق لأنها مُحَرَّقة بالإضرار و لا تفكر فكرة  
 صواب و يقول ا يطير الإنسان ام لا لأنه ممتنع أن يطير .

33v

و الحجة الرابعة إن الأشياء الواجبة فيها قوة واحدة أي أنها تكون إضراراً . و الأشياء  
 الممتنعة فيها أيضاً قوة واحدة أي أنها لا تكون البتة - وقد نرى أشياء كثيرة  
 فيها قوتان أن يكون الشيء كما هو و أن لا يكون . مثل الثوب الصحيح الذي إن ترك  
 ٨٠٠ على حاله بقي حتى يبلى على الأيام ؛ و إن قطع قبل التقطيع . و كالحديد والرصاص  
 وسائر ما كان مثلهما إن تركا بقيا جامدين و إن أذيبا قبل الأذابة و يقبلان إذابة  
 أقلّ او أكثر من غيرهما و كذلك الهواء قد يقبل الحرّ و البارد القليل او الكثير - فقد  
 تبين أن الممكن موجود و هو على ثلاث جهات . أحدهنّ طبيعيّ / و هو يسير و ذلك  
 كرجاء المطر عند إستواء السحاب المخليل في الشتاء فإنّ هذا إمكانية أن يكون منه  
 ٨٠٥ مطر أكثر من أن لا يكون ، و الأخرى بالأمنية و هو عسير و ذلك كقطع بعض السفل  
 و المساكين من الناس في أصابة الملك و الشرف . فمثل هذا إمكانية أن لا يكون ملكاً  
 أكثر من أن يكون ؛ فإن كان ملكاً فإنما يكون بعرض قويّ - و الثالثة الممكن  
 المستويّ و هو ما يكون بالفكر و ذلك كرجاء المرأة الحُبلى أن تلد ذكراً فإنّه ليس  
 رجاؤها لذلك بأقوى من خوفها أن تلد أنثى . و الممكنات منها ما يظهر في الأجسام  
 ٨١٠ لقبولها للشيء و خلافه و ذلك كالماء الذي يمكن أن يكون بارداً ، ثمّ يسخن و يقبل  
 برداً أقلّ او أكثر من برده و سخونة أقلّ او أكثر من سخونة - و منها ما يكون بالفكرة

وأختيار شيء من شيء آخر. وذلك كالإنسان الصحيح الجوارح فإنه يمكنه أن يتفكر في أن يقوم وأن لا يقوم، وأن يتكلم وأن لا يتكلم وأن يلتفت وأن لا يلتفت، ثم يختار أحدهما و يفعله لما في النفس من قوة الفكرة فيه والإختيار لأحدهما و لما في الجسم ٨١٥ من الإمكان لقبول الفعل -

فلما فرغ الفيلسوف من تثبيت الممكن أخبر أن الممكن يوول إلى الواجب أو إلى الممتنع و ذلك كقائل يقول: أمشي غداً أو لا أمشي لأنّ المشي و خلافه ممكن له فإذا مشى فقد صار مشيه واجباً لأنه قبل أن يمشي كان المشي ممكناً له فلما مشى إرتفع عنه /الإمكان و صار في حد الواجب فإن لم يمشي في غد صار في حد الممتنع ٨٢٠ لأنه لم يكن المشي متهيئاً له -

فإذا بيّنا حالات الإمكان فبيّن أنّ الكواكب هي الدالة على العناصر الثلاثة التي هي الواجب و الممكن و الممتنع . - و نقول أنّ كلّ شخص في هذا العالم من أشخاص الحيوان و النبات و المعادن مركّب من الأركان الأربعة التي هي النار و الهواء و الماء و الأرض لأنها موجودة في كلّ شخص من الأشخاص، وكلّ ركن منها يقبل الزيادة ٨٢٥ و النقصان و الإستحالة من بعضها إلى بعض لأنه قد تكون حرارة دون حرارة و هواءً أرطب من هواءٍ و ماءً أبرد من ماءٍ و أرض أيبس من أرضٍ و قد يستحيل بعضها إلى بعض - فإذا كان كلّ ركن منها على الأفراد فيه قوة يقبل بها التغير و الأشخاص مركّبة من هذه الأركان الأربعة : فالأشخاص المركّبة إذاً فيها قوة لقبول الزيادة و النقصان و الإستحالة من بعضها إلى بعض و بحركة البروج و الكواكب عليها تكون ٨٣٠ حركتها وقبولها للتغيرات و التركيبات - فالبروج و الكواكب إذاً هي الدالة على حالات الأركان الأربعة و تغييرها و تركيبها في الأشخاص بإذن الله - فأما الإنسان الحيّ فإنه مركّب من النفس الحيوانية و الناطقة و الطبائع الأربعة .

وقد ذكر الفيلسوف أنّ الكواكب حيّة و لها أنفس ناطقة فهيّ بالنفس الناطقة التي لها و بأنّها حيّة و بحركاتها الطبيعية تدلّ على إتفاق النفس الناطقة و الحيوانية / في ٨٣٥ البدن بإذن الله كما ذكرنا فيما تقدّم . - و للنفس الناطقة قوة الفكرة و الإختيار ،



و للبدن قوة قبول الممكنات . فإذا دلت الكواكب على إتفاق النفس الحيوانية و الناطقة و البدن . فقد دلت على الواجبة و الممتنعة و الممكنة لأنَّ الإنسان الحي له الحياة التي هي واجبة له و الإمتناع من الطيران ، و الإمكان لأنَّ يقبل المرض و الصِّحة و الحرارة و البرودة و الرطوبة و اليبوسة و فيه أنَّ يتفكر في أشياء كثيرة و يختار أحدها و القوة التي بها يختار الشئ من شئ آخر بالفكرة فيه إنما هي للإنسان دون الحيوان كله و إمكان قبول الشئ و خلافه إنما هو للأجسام و أفاعيلنا إنما تكون بتقدمة فكرتنا في الشئ الذي نريد فعله . فإذا تقدّم في النفس أنَّ فعل الشئ و خلافه ممكن فعلنا أحدهما أو إستشارنا فيه - و المنجم إنما ينظر إلى الأشياء التي فيها قوة الإمكان لقبول الشئ و خلافه إلى ما يوول الأمر فيه و لا ينظر إلى خاصيتها لأنَّه لا ينظر المنجم في صناعة النجوم هل النار محرقة أو لا ، لأنَّه يعلم أنَّها محرقة ، و لا ينظر في دلالات الكواكب هل الثلج باردٌ أو لا لأنَّه يعلم أنَّه باردٌ . و لكنَّه ينظر هل تحرق النار غداً جسماً من الأجسام القابلة للإحراق أم لا و هل يبرّد الثلج غداً شيئاً من الأشياء القابلة للتبريد أم لا و هل يكون غداً مطر أم لا و هل يختار الإنسان أن يكلم غداً فلاناً أم لا أو يمشي غداً أو لا . فإنَّهم ينظر في هذه الأشياء لأنَّ هذه الأشياء ممكن أن يكونَ و ان لا يكونَ فإذا .

٨٤٠

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دلت الكواكب بحركاتها الطبيعية على أنَّ شيئاً من الأشياء لا يكون ، فهو ممتنع أن يكون و إذا دلت على كون شئ من الأشياء في وقت الدلالة مع اسواء بسواء ، فكونه من الواجب - و إن كانت تدلّ أنه يكون في زمان مستقبل فدلالته على كون ذلك الشئ إنما هو بالقوة إلى الوقت الذي يكون . فإذا كان الشئ صار كونه من الواجب .

35r

و كذلك الإنسان الذي لا يمنعه من الكلام آفة ، فإنَّ الكلام فيه بالقوة إلى الوقت الذي يتكلم فإذا تكلم صار ذلك الكلام في ذلك الوقت من الواجب . و النار أيضاً فإنَّها و إن كانت محرقة فألحراق فيها قبل أن تفعل بالقوة فإذا أحرقت صار الإحراق من الواجب -

٨٥٥

فقد تبين لنا الآن أنَّ الكواكب قد دلت على الممكن و على الإختيار و ذلك في شيئين : أحدهما في التركيب كالممكن الذي في شخص الإنسان لقبول الشئ و خلافه و الإختيار الذي لنفسه . و الثاني في الأشياء التي تدلّ على كونها في الزمان المستقبل كما ذكرنا ، و الكواكب كما دلت على الممكن و الإختيار الذي للإنسان فكذلك تدلّ على أنَّ الإنسان

٨٦٠

- 35v لا يختار إلا ما تدلّ عليه الكواكب لأنّ اختياره للشئ أو خلافه يكون / بالأنفس الناطقة التي مزجت النفس الحيوانية في الأشخاص بدلالات الكواكب و ذلك كإنسان الذي في جسمه قبول الإمكان للحركة ولتركها ولأنّ يقوم وإن لا يقوم وفي قوة النفس اختيار أحدهما ، فإذا إختار فعل أحدهما أو تركه فقد صار إلى حدّ الواجب أو الممتنع لأنّ
- ٨٦٥ الممكنات أو الإختيار يصير إلى أحدهما لا مُحالة إلا أنّ الإنسان لا يختار إلا ما تدلّ عليه الكواكب من الواجب أو الممتنع - فأمّا قبول الممكنات فإنّما يوجد في هذه الأركان الأربعة التي دون فلك القمر و في الأجسام المركّبة منها - فأمّا الكواكب فليس لها ذلك لأنّها أجرام بسيطة فأمّا الإختيار الذي يكون بالفكرة في الأشياء فإنّما هو للإنسان دون الحيوان كله لأنّ له النفس الناطقة التي بها يتفكر في الشئ أو خلافه ، ثمّ يختار أحدهما ليدفع عن نفسه بقدر معرفته ألمكاره أو الآفات بذلك الإختيار . فأمّا سائر
- ٨٧٠ الحيوان فإنّما تكون أفاعيلها بطبيعته لأنّ ليست له النفس الناطقة التي بها تكون الفكرة - فأمّا الكواكب وإن كانت لها أنفس ناطقة فإنّها لا تحتاج إليه لبُعدها من الآفات .

#### - الصنف الرابع -

- 36r وأمّا الصنف الرابع ممّن ردّ دلالات الكواكب ، فهم قوم نظروا في علم / الكلّ [ أعنى في ٨٧٥ علم الأفلاك و حالاتها ] فقالوا أنّ الكواكب لا دلالة لها على الأشياء التي تكون وتحدث في هذا العالم من أشخاص الحيوان و النبات و المعادن و إنّما دلالتها على تغيير الأزمنة فقط - و لم يقدر هؤلاء القوم الذين نظروا في علم الكلّ أن يجحدوا هذا القدر من قوة فعل الكواكب لأنّ هذا من فعلها موجودٌ ظاهر و دفعه بُهت مكشوف على أنّه لم يدفع علم الأحكام و ثبت دلالة الكواكب على تغيير الأزمنة إلا من كان قليل المعرفة بطبائع الأشياء
- ٨٨٠ و بما يتولد من إنتقال بعضها إلى بعض . لأنّ العالم بما ذكرنا يعلم أنّ تغيير الطبائع و إختلاف حالاتها إنّما يكون بتغيير الأزمنة ، و تغيير الأزمنة إنّما يكون بقوة حركة الكواكب و الأشياء التي تحدث في هذا العالم إنّما هي بتغيير الطبائع و ينتقال الأزمنة من حال إلى حال آخر . فالكواكب إذاً بقوة حركاتها و بتغييرها للأزمنة و نقل بعضها إلى بعض قد دلت على ما يحدث في هذا العالم -



٨٨٥ وقد زعمت كل الفلاسفة أن للكواكب دلالات على الأشياء الكائنة في هذا العالم وكانت كلها تستعمل هذا النوع الثاني من علم النجوم في كل شيء من حالاتهم وحركاتهم من الأمور الدينية والدنيوية. وذلك ظاهر من أفاعيلهم عند من عرف مذهبهم وإنما فعلوا ذلك لأنها أعلا الأجسام وأشرفها وهو غير مشكوك فيه / عند الفلاسفة أنه بقوة حركاتها يكون الكون والفساد في هذا العالم بإذن الله - ويقولون أن الواجب على من ٨٩٠ نظر في النوع الأول من علم النجوم أن ينظر بعده في النوع الثاني منه لأنهما علمان متصلان أحدهما بالآخر - والعلم الثاني ثمرة العلم الأول لأن العالم إذا عرف كيفية حركات الأفلاك والكواكب وكميتها فإنما ثمرة ذلك أن يعرف ما تدل عليه قوى تلك الحركات والحالات على الأشياء الكائنة في هذا العالم. وإذا لم يعلم ما تدل عليه الكواكب بحركاتها، فلا ثمرة إذن للنوع الأول من علم النجوم - وما حال هؤلاء القوم ٨٩٥ الذين نظروا في العلم الأول ولم يعرفوا هذا العلم المتصل به إلا كحال القوم الذين يكون عندهم العقاقير والأدوية المعجونة وهم لا يعرفون كيف يستعملونها ولا لأي شيء تصلح تلك العقاقير والأدوية من العلاجات ودفع الأمراض - فذلك هؤلاء أيضاً يعرفون حالات الكواكب ومواضعها من البروج ولا يعلمون على أي شيء تدل كل كوكب في برجه وفي حاله وما أتى هؤلاء في دفعهم هذا النوع الثاني ٩٠٠ من علم النجوم إلا أنهم قوم لا يستعملون أنفسهم فيه فدفعوه لأنهم إذ أثبتوه عابهم الناس بتركهم معرفته، ويقال لهم إن نوعين من العلم، أحدهما متصل بالآخر يحسنون أحدهما ولا يحسنون الآخر - /

#### - الصنف الخامس -

وأمّا الصنف الخامس فهم قوم نظروا في علم الكل أيضاً وأبطلوا علم أحكام النجوم ٩٠٥ من جهة التجارب وقالوا أن الأحكام على الكواكب لا تصح لأن الأشياء إنما تدرك بالتجارب وأقل ما يمكن إدراك حقيقة الشيء بالتجربة إذ وجد في حال واحدة مرتين . والكواكب لا يمكن فيها ذلك لأن الكوكب إذ كان في موضع من البروج وكانت سائر الكواكب ناظرة عليه أو مقارنة له ، فإنها لا تعود إلى تلك الحال من تلك البرج التي كانت فيها إلا بعد ألف سنين . ولا يبلغ عمر الإنسان الواحد هذا القدر من السنين : فكيف يمكن ٩١٠ الإنسان أن يجد الكواكب مرتين على حال واحدة حتى يجرب من رجوعها إلى مكانها ما تدل عليه ؟

فقلنا أنّ الأوائل إنّما عرفوا طبائع الكواكب و دلالتها من أشياء مختلفة بعضها جزئية ظاهرة و بعضها كلية - فأمّا الجزئية الظاهرة فكما يوجد من أثر الشمس في التسخين والقمر في الترطيب والتعفين ومن أثر الكواكب في تغيير الهواء في كلّ يوم وليلة - ٩١٥  
 37v و أمّا الكلية فكما يوجد من دلالتها في تحاويل سني العالم والموايد من إختلاف /أحوال في الحرّ والبرد والإعتدال والصحة والمرض والموت والأسفار وسائر الحالات الكلية والجزئية-

وهذه أشياء ظاهرة يدركها الفيلسوف من الناس في زمانٍ قليل إذا قاس كواكب عدّة سنين وحالاتها إلى كواكب سنين غيرها من حلولها في البروج النارية والأرضية أو الهوائية أو المائية في أيّ موضع تكون من البرج بعد أن تعرف طبيعة البرج وأدلته . ٩٢٠  
 وكذلك فعل الأولون الذين رصدوا الكواكب فإنّ الرجل منهم لم يرصد الكواكب الف سنة ولا خمس مائة سنة ولا كان بلغ عمر الرجل العالم منهم هذه السنين ولكن كان الرجل العالم بالقياس يقيس الكواكب زماناً من عمره فيعرف المواضع التي يجدها فيها في أوقاته تلك ويكتب مواضعها من البروج وتاريخ قياساته . فإذا أتى على ٩٢٥ ذلك القياس سنون كثيرة إنتدب بعض حكماء أهل ذلك الزمان فقام الكواكب وإعتبر بين مكانها عند قياسه لها وبين مكانها في وقت قياس من كان قبله ممّن كان يوثق بقياسه ليعرف صواب ذلك -

وبمثل هذا العمل أدرك بطليموس الحكيم حقيقة مواضع الكواكب لأنّه نظر إلى قياسات /الكواكب التي كان قامها من كان قبله بزمان كثير، كابرخيس وغيره من الحكماء ٩٣٠  
 38r الموثوق بقياسهم فعرفها؛ ثمّ قام هو في زمانه مواضع الكواكب سنين كثيرة ونظر ما بين قياسه وقياس أولئك الأولين من الإختلاف فعرفه وبحث عنه بحثاً شافياً حتّى عرف عللها وصحّ له مواضعها بما تقدّم من قياس الأولين لها . -

و لو كان بطليموس وكلّ المتقدّمين الذين عنوا بحقيقة مواضع الكواكب إنّما كانوا يرصدونها إذا كانت في ذرّة أفلاك تدويرها أو في موضع معلوم منها ، ثمّ وافق موضع



٩٣٥ الكوكب من فلك تدويره مثل موضعه من فلكه الخارج المركز ، ثم يتركونها إلى أن يعود الكوكب إلى ذلك الموضع من فلك تدويره و فلكه الخارج المركز ثم يقيسونه مرة أخرى لكان حقيقة موضع الكوكب لا يوجد البتة وكان لا يعرف عدد أفلاك الكواكب و لا ذروة كل فلك و لا حضيضه و لا سائر مواضعه إلا أنهم بالرصد الكثير في مرار كثيرة في سنين مختلفة في زمان بعد زمان عرفوا مواضع الكواكب وسيرها في سنة سنة وأدوارها و عدد أفلاكها و غاية علو كل فلك وهبوطه و سائر مواضعه و حالاتها . ٩٤٠

و كذلك عرفت الحكماء ما إشتبه عليهم من طبائع الكواكب / ودلالاتها فأنهم نظروا إلى مواضعها او حالاتها في بعض البروج في زمان من الأزمنة فوجدوا لها الدلالات على الأشياء معلومة فعرفوا تلك الدلالات و كتبوها وجعلوا مواضعها و حالاتها مثالا يقيسون عليه ، ثم فتش عن تلك الدلالات قوم من الحكماء بعد سنين كثيرة اعتبروا مواضع الكواكب في زمانهم ذلك بما كان وجده المتقدمون فوجدوا لها الدلالات على أشياء مُشاكلة للدلالة الأولى فجعلوا تلك الدلالات أمثلة وإعتبارات . ثم نظرت الفلاسفة إلى تلك الأشياء التي كانت الكواكب دلت عليها مرة بعد مرة فقااست عليها ما كان خفى عنها من دلالاتها فصح لهم ما أرادوا من دلالات الكواكب - ٩٤٥

و لو كانوا فتشوا عن دلالاتها عند رجوعها إلى مواضعها بعد الف سنين فلم يكن يتبين لهم شئ البتة وإنما يتبين لهم ما أرادوا من الدلالات حين عرفوا في وقت بعد وقت في سنين كثيرة مختلفة مواضع الكواكب و دلالاتها فقااسوا على ما وجدوه ما كان غايبا عنهم حتى علموا دلالاتها على الأشياء - وكذلك العلماء فأنهم إنما وجدوا الأشياء الخفية لأنهم قاسوا عليها بما كان ظاهرا عندهم من ذلك الجنس لأن الإخبار الصادقة عن شئ من الأشياء مرة بعد مرة في / اوقات مختلفة و الدلالات الواضحة عليه تقوم مقام المعاينة والوجود الحاضر - ٩٥٥

#### - الصنف السادس -

و أما الصنف السادس فهم قوم من أصحاب الحساب عجزوا أن ينظروا في حساب النجوم و تقويم الكواكب من الكتاب الذي فيه علم الكل [ اعنى كتاب المجسطي ]

فحسبوا مواضع الكواكب بالزيجات الجزئية المختلفة فوجدوا كل كوكب إذا حسبه  
 ٩٦٠ ببعض الزيجة في درج معلومة من بعض البروج ، فإذا حسبوا ذلك الكوكب بزيج  
 آخر وجدوه في غير تلك الدرجة من البروج . فذكر هؤلاء القوم أن الأحكام لا تصح و احتجوا  
 على قولهم بخجتين : أحديهما أنهم قالوا أن الإنسان إذا أراد أن يقوم الكواكب ببعض  
 الزيجات فإن في الحساب الذي به يقوم الكواكب من اوساطها وتعاديلها جبراً كالثواني  
 و الثوالث فيقع على طول الأيتام في موضع درجة الكوكب خطأ - و الحجة الثانية أنهم  
 ٩٦٥ قالوا أن الأحكام إنما تكون على حقيقة درجة الكوكب وليس شئ من الكواكب توفق  
 على حقيقة درجته من برجه لأنه إذا وجد بعض / الكواكب في بعض البروج في درجة  
 معلومة ببعض الزيجة وجد موضعه بالزيج الآخر مخالفاً لتلك الدرجة و لا يدرى ايهما  
 أصواب فإذا لم توفق على حقيقة درجة الكوكب من برجه فإنه لا يصح الحكم عليه  
 وهؤلاء قوم غلطوا و لم يقعوا من صواب الزيجة على شئ فسبق على اوهامهم أن  
 ٩٧٠ غلطهم مما يدخل إلى صاحب صناعة الأحكام -

فرددنا عليهم قولهم بخجتين - أحديهما أننا قلنا أن المنجم إذا أراد أن يحكم على  
 شئ فإنما يعتمد فيه على النظر إلى طبيعة الكواكب و خاصيتها و ربّ برج كل واحد  
 منها و شرفه و أرباب مثلثاته و موضعه من الودد و ما يليه و الساقط و حلوله من  
 بيت المال و بيت الإخوة و سائر بيوت الفلك و دلالاتها على الأقاليم و سائر الأدلة  
 ٩٧٥ الكلّية التي لها ، ثم يحكم على قدر ما يدلّ عليه - و أمّا درجة الكوكب فإن لها دلالة  
 جزئية ، إنما يستعملها أصحاب النجوم في أشياء خواص فإن كان في موضع الكوكب  
 خطأ دقائق او درجة لم يضّر صاحب الحكم ذلك - و الحجة الثانية إن على المستعمل  
 لصناعة الأحكام إذا أعطاه الحاسب مواضع الكواكب من البروج لبعض الأوقات أن يخبر  
 / أن تلك المواضع التي فيها الكواكب تدلّ على كذا و كذا فأمّا تصحيح درج الكواكب و في  
 ٩٨٠ أي موضع هي من بروجها على الحقيقة فإنما ذلك على أصحاب الحساب - و قياس  
 ذلك المتطبّب : فإنما عليه أن يخبر عن طبيعة كل دواء لأيّ شئ يصلح و لأيّ الأمراض  
 ينفع . فأمّا طلب العقاقير في البلدان و دقها و تحللها فليس ذلك على الطبيب و إنما هو  
 على أصحاب العقاقير .



و كذلك الْمُحْتَجِّ لصناعة الأحكام المثبت لها الحاكم على ما تدلّ عليه الكواكب إنّما عليه ٩٨٥  
 أنّ يبين أنّ للكواكب فعلا في هذا العالم بالحجج و يخبر بعلاها و بما يدلّ عليه من  
 طبائعها و خاصّيتها و مسامنتها للمواضع و بمواضعها في كلّ برج و على الحسّاب أن  
 يصحّحوا درجها . فإنّ جهل أحد منهم حقيقة ذلك ، كان عيب ذلك الجهل راجعا على ذلك  
 الحاسب لأنّه جهل ما يجب عليه أن يتعلّمه من صناعته . على أنّ القوم الذين إقتصروا من  
 علم الكلّ على التقويم بالزيجات الجزئية إقتصروا على شيء ضعيف الأصل لأنّهم إذا فتشوا ٩٩٠  
 عن أصولها وجدوا فيها من الفساد و الاختلاف ما لا يقفون معه على حقيقة شيء منها .  
 و إذا قوّموا الكواكب بكلّ واحد منها ثمّ تفقّدوا مواضعها من البروج و مقارنة بعضها  
 لبعض / فوجدوا بين ما يخرج لهم من الحساب بها و بين ما يرونه بالبصر او يخرج لهم من  
 القياس بالآلات الصحيحة شيئا بعيدا من الخلاف و لهم فيما همّ فيه من الدهش و الحيرة  
 بسبب اختلافها شغل عن عيب علم أحكام النجوم -

40v

٩٩٥ و ما منعنا أن نذكر ما في كلّ واحد من الزيجة من الفساد إلّا الإبقاء على مودّة  
 كثير من إخواننا ممّن يستعملها و يكسب بها- و الذي ينبغي أن يعتمد عليه أصحاب  
 الأحكام و كلّ المستعملين بحساب الكواكب السريعة و البطيئة السير إنّما هي مواضعها  
 التي توجد بالقياسات الصحيحة في كلّ زمان بالحلق و الآلات الموصوفة في كتاب  
 المجسطي لأنّه بتلك الآلات يوجد مواضعها بالعيان وجودا لا شكّ في صوابه- و من ذلك  
 ١٠٠٠ الكتاب ينبغي للناظر في علم أحكام النجوم أن يتقدّم في علم كلّ شيء يحتاج إليه من  
 كيفية علم الأفلاك و الكواكب و كمية حركاتها و سائر حالاتها -

#### - الصنف السابع -

و أمّا الصنف السابع فإنّهم دفعوا هذا العلم لأنّهم نظروا فيه فلم يُمكّنهم أن يبلغوا منه  
 ما يريدون فهم يحسدون أصحاب هذه الصناعة على معرفتهم بها فيدفعون علم صناعة  
 ١٠٠٥ / الأحكام لحسدهم لأهلها و لعجزهم عن معرفتها- [فهؤلاء لا ينقادون بخجة تلزمهم  
 إذ كان جحدهم لهذه الصناعة على غير معرفة و الجاحد لا يكلّم إلّا بما يقصره و يرثه  
 إلى الحقّ اللازم]-

41r

## - الصنف الثامن -

١٠١٠ و اما الصنف الثامن فهم [ مدّعوا علم الطب للتكسب به ، لا ] الأطباء الخذاق العلماء بصناعة الطب الذين قد قرؤوا كتب الأوائل في علم الطب وعرفوا أصول صناعتهم وإختلاف الطبائع والأزمنة وتغييرها و سائر ما يحتاجون إليه في صناعتهم من الأشياء المفردة والمرغبة . فهم يعرفون فضيلة علم أحكام النجوم ويعلمون أنّ علم النجوم هو أولية علم الطب و يستعملون صناعة أحكام النجوم مع صناعة الطب إستعمالا دائما في معرفة الأوجاع و زيادتها ونقصانها وفي اوقات العلاجات ، فكثّر صوابهم في صناعتهم ويسلم المرضى عليهم و يبرون على ايديهم وتكثّر منفعة الناس بهم - فاما قوم من أطباء العدد ممن كثر جهلهم وقصرت عقولهم عن معرفة ما يحتاجون إليه ، وإنما قصدهم في صناعتهم تقدمه الكسب و تأخر المعرفة فردّوا صناعة أحكام النجوم و قالوا : أنّ الكواكب لا قوة لحركاتها في هذا العالم فإنّ صناعة الطب موجودة ثابتة فأبطلوا صناع الأحكام بزعمهم / وأثبتوا صناعة الطب . -

41v

١٠٢٠ و هؤلاء قوم من الأطباء إنّما ينظر أحدهم من الطب في العلم الجزئي كالكحل والجبر وظاهر علاج المرضى و إنّما إستفاد هذا القدر اليسير من العلم بظاهر المعرفة و قليل الزمان . فهو غير عالم بما يتعاطي من ذلك أيضا لأنّه لم يتبحر قراءة كتب الأوائل في صناعة الطب و في تقاسيمه و لا عرف طبائع الأشياء و لا طبائع الزمان وإتفاقها وإختلافها و لا عرف إختلاف العلاجات و لعله إنّما قرأ طرفا قليلا من بعض الكتب -

١٠٢٥ فمن كان مثل هؤلاء من الأطباء فهم يثبتون صناعة الطب لأنّهم يكسبون بسببها ويدفعون علم أحكام النجوم لقلّة علمهم بها و ليس هذا العلم وحده يدفعون بل يدفعون كلّ علم يحتاجون في معرفته إلى الفكرة . - ولو كان هؤلاء قرؤوا كتب الطب لعرفوا أنّ معرفة أحكام النجوم نافعة لهم في صناعتهم و أنّهم يحتاجون إليها -

١٠٣٠ و قد قال ابقراط الحكيم في كتاب الأهوية حين ذكر إختلاف الأهوية والطبائع أنّ الأشياء التي ذكرنا من تغيير الأهوية : هي من علم النجوم . فإنّ علم النجوم ليس بجزء صغير من علم الطب . و إنّما قال هذا المرؤا الحكيم هذا القول لأنّ الأطباء إنّما يستدلّون على الأشياء بإختلاف الأزمنة وتغيير الطبائع / و إنّما يكون هذا الإختلاف و التغير بقوة

42r



حركة الشمس والكواكب و هذا هو من علم النجوم - فالأطباء إذا مضطرون إلى معرفة علم النجوم ليعرفوا بها أصول صناعتهم على الحقيقة -

١٠٣٥ وأيضاً فإنَّ المتطبِّبَ إنَّما ينبغي له أن يُعالجَ المريضَ الَّذي قد رأى له المنجِّم من دلالات النجوم أنَّ عمره لم يَنْقُذْ و أنَّه ينتفع بالعلاج و يبرئ من علته - وإذا لم يرَ المنجِّم له عمراً و لا بُرءاً من علته ، فلا معنى لعلاج المتطبِّب لذلك المريض -

فأمَّا الأيَّامُ المعلومة [ أعنى أيَّام البحْران ] الَّتِي تحتاج إليها الأطباء في معرفة حال المريض في قوته أو ضعفه وزيادته أو نقصانه فإنَّما يعرفونها من مسير القمر و مَمازجه الكواكب له . - وقد ذكر ذلك أبقراط و جالينوس الحكيمان في كُتُبِهِما وقد ذكر كلَّ المتقدمين من علماء الطِّبِّ أنَّ علم النجوم هو علَّة علم الطِّبِّ - فهؤلاء الصنف من الأطباء الَّذين لم يعرفوا أنَّ أصل صناعتهم إنَّما هو من علم صناعة النجوم عابوا صناعة الأحكام ، فإذا عابوا صناعة الأحكام ، فقد عابوا صناعتهم لأنَّ صناعة الأحكام هيَّ علَّة صناعة الطِّبِّ ، إلَّا أنَّ هذا الصنف من الأطباء جهلوا هذا القياس و غلطت ١٠٤٥ أفهامهم عن معرفته -

#### - الصنف التاسع -

٤٢v و أمَّا الصنف التاسع و هيَّ العامَّة - فهم في ردِّ علم الأحكام / على صنفين . - أمَّا أحد الصنفين فإنَّهم لا يعرفون فضيلة علم الأحكام و لا فضيلة سائر العلوم و لا فضيلة تقدمة المعرفة بالأشياء و افضل الناس عندهم مَنْ كان أكثرهم مالاً و يكون حظ المال عندهم أكثر من حظ العلم و يقولون أنَّ الإنسان إذا كان غنياً ذا مالٍ ، فإنه لا يضره إن يكون جاهلاً بعلم النجوم و الطِّبِّ و بسائر العلوم -

فقاسوا قياساً فاسداً لأنَّهم قاسوا العلم بالمال ، و هذا قياسٌ خطأ لأنَّ الشَّيْءَ إنَّما يقاس بجنسه كالعلم بالعلم و المال بالمال ، و لا يقاس الشَّيْءُ إلى غير جنسه . و لا يقاس إذاً المال بالعلم و لو لا أنَّ هذا شَيْءٌ يُسمَعُ من العامَّة كثيراً يغيرون به أصحاب العلوم لكان ينبغي لنا أن لا نشغل أنفسنا بالفكرة في قولهم إلَّا أنا قد تَلَطَّفْنَا في ردِّ قولهم . فإنَّ قلن أنَّ المال و الجَدَّة قد يتهيأ للجاهل و للعاقل و للقوي

و للضعيف . وليس الإنسان بمحمود على ما تهيأ له من ذلك ، لأنّ هذا لم يتهيأ له بعلمه  
 و لا بجهله و لا بقوته و لا بضعفه - و إنّما يحمد الإنسان على التمييز و العلم ، لأنّ فضل  
 الإنسان على سائر الحيوان إنّما هو بالتمييز الذي فيه بآلة العقل و معرفته بالأشياء  
 ١٠٦٠ التي كانت و التي تكون فكلّما ازداد الإنسان معرفة بما ذكرنا ، ازداد من البهيمة  
 43r تباعداً بما فيه من المعرفة / و تقدمة العلم بالأشياء الكائنة و كلّما قلّت معرفته  
 ازداد من البهيمة قرباً بما فيه من قلة التمييز . و لو لا فضيلة العلم و التمييز لما  
 كان للإنسان فضل على البهائم لأنّها كلها تشترك في الأكل و الشرب و التناسل . فإنّما  
 فضل الإنسان على سائر الحيوان بالعقل و التمييز - فمن كان من الناس اوفر عقلاً و أكثر  
 ١٠٦٥ علماً ، فهو افضل في الإنسانية من غيره . فحظ العلم و التمييز في معنى الإنسانية  
 افضل من حظ المال و افضل ما في الإنسان معرفته بالأشياء الكائنة و اكثر ما يكون  
 هذا في علم صناعة أحكام النجوم . فحظ علم النجوم و سائر العلوم في معنى  
 الإنسانية افضل من حظ المال -

#### - الصنف العاشر -

١٠٧٠ و أمّا الصنف العاشر و هم العامة أيضاً فإنّهم دفعوا علم هذه الصناعة لما رأوا من  
 كثرة خطاء من يدّعيها - و ذلك لأنّ العامة إنّما يقبلون الأشياء على التمييز الظاهر فلمّا  
 رأوا كثرة خطاء من يدّعي هذه الصناعة فيما يسألون عنه من أحكام النجوم كذبوا بها  
 43v و دفعوها و نسبوا اهلها إلى الجهل و قالوا : هيّ صناعة باطلة / و لو كانت صادقة لما كثر  
 خطاء المدّعين لها فيما يسألون عنه و هو لاء غير ملومين في ردّهم علم هذه الصناعة  
 ١٠٧٥ لأنّ اكثر من يدّعيها إنّما هم قوم من جهلة الناس و سقاط الأمم ينسبون أنفسهم إلى  
 العلم بها و هم بها جهال و يضعون أنفسهم من معرفتها بحيث لا يحسنونه غلطوا عن  
 ألفهم و التمييز و رفعوا أنفسهم عن الإختلاف إلى العلماء و التعليم منهم . و إنّما  
 يقرؤون بعض الكتب المستغلقة المعنى التي لا يفهمونها او الكتب التي لا يوثق بعلم  
 من ألفه فيجدون في معنى واحد شيئين مختلفين لا يدرون ايها أصواب . و إذا سئلوا  
 ١٠٨٠ عن جنس ذلك المعنى مرّة بعد مرّة إستعملوا في النظر فيه في كلّ مرّة أصلاً خلاف  
 أصل الأوّل لقلّة علمهم بطبائع الكواكب و حالاتها و دلالاتها ، و يستعملون بإسم هذه  
 الصناعة ألوان التمويه و الخدع و يخدعون ضعفاء العقول من النساء و القوم



44r المنكوبين والمغتمين من ذوي الإقدار والراغبين الراجيين الآملين لأنواع السعادات من المال والقدر والزيادة فيهما و رُبما تهيا لأحدهم صواب واحد عند بعض / هولاء ١٠٨٥ بإتفاق القول من غير معرفة عنهم بمعنى ذلك القول فيذكرونه و يفتخرون به ويستأكلون به صاحبه و يتناسون ما سلف من كثير خطائهم وكذبهم في سالف الأيام و هولاء قوم إنما قصدهم الكسب و النيل ، لا العلم و الحكمة و التبخر في علم هذه الصناعة لأن من أراد أن يتبحر في علم أحكام النجوم فإنه يحتاج إلى معرفة الأشياء التي ذكرناها قبل لتكون تلك الأشياء سبباً إلى علم هذه الصناعة و هي اختلاف حالات الكواكب و معرفة الطبائع و إتفاقها و اختلافها و اختلاف الأقاليم وحالاتها و اختلاف أحوال الحيوان والنبات والمعادن و ما يحدث في كل واحد منها عند إنتقال الأزمنة و الأقاليم و سائر ما ذكرنا فيما تقدم و ما نذكره فيما يتأخر - ومعرفة هذه العلوم إنما يمكن في زمان كثير و بتعب شديد و يعجز هولاء عن معرفة بعضه -

44v فهم يوتون في خطائهم من جهتين : أما أحديهما فقلة علمهم بهذه الصناعة . و أما الثانية فإن غرضهم المنفعة فإذا سألهم السائل الذي له القدر عن شيء قصدوا في الجواب عنه إلى / الشيء الذي يفرح به و يقع بموافقته فيخبرونه أن النجوم تدل على ذلك الشيء توحيًا منهم بمسرته و طمعا في ماله و يوقتون له الأوقات الكاذبة ، فيتعلق قلب السائل بها فيتعجلون منه بذلك المنفعة و حسن الرأي و الزيادة في الجاه و القدر و تكون معاملتهم لأصناف الناس كلها على مثل هذه الحال التي وصفنا - فيذم العامة أهل هذه الصناعة كلهم و يذكرونهم بالمكروه و يكذبونهم فيبثلي العلماء بها من ذكر العامة إيههم بالمكروه بسبب القوم الجهال الذين يدعون علمها ممن تقدمت صفتنا لهم - وليس يلأم العامة على ذمهم أهل هذه الصناعة و فيهم من يعلم مثل هذه الأشياء - فإنما يتعجب من كان له تمييز و معرفة و ظهرت له هذه الحالات من الكذب و التمويه من بعضهم فسمع منه و قبل قوله و وثق بما يخبره به أو ظن أن لقوله حقيقة ، و قد كان ١١٠٥ حقيقة على المدعين لهذه الصناعة أن يستعملوا أنفسهم فيما يجب عليهم تعليمه قبل النظر فيها ، ثم يترقون بعلمهم بتلك الأشياء إلى هذه الصناعة الشريفة الجليلة السارة للنفس - /

- الفصل السادس - في منفعة علم الأحكام، وأنّ تقدمه المعرفة بالأشياء الكائنة في هذا العالم من قوة حركات الكواكب نافعة جداً

١١١٠ إنّ قوماً قالوا: إن كان علم النجوم حقاً كما زعمتم، فهو علم لا منفعة فيه لأنّ الذي يدلّ عليه النجوم إنّما هي الأشياء اللاتي تكون، وهذا شيء لا حاجة بالإنسان إليه لأنّه إن كان ذلك الشيء خيراً أو سروراً فإنّه سيناله في وقته و تقدمه العلم به لا منفعة فيه - وإن كان ذلك مكروهاً فإنّه بتقدمه معرفته به يتعجّل الإغتمام ثمّ يعقب تلك المعرفة لإغتمام بها و الفكرة في الخوف منها إلى وقت حلوله به ولا يقدر العالم بصناعة علم النجوم على دفع ما هو كائن من المكاره - وقد غلط هؤلاء و تركوا سبيل التمييز و المعرفة و لم يعرفوا فضيلة هذا العلم و لا منفعته. و إنّما يعلم منفعة هذا العلم من يعلم منفعة بتقدمه العلم بالأشياء الكائنة على أنّ هؤلاء الذين دفعوا المنفعة بهذا العلم إنّما دفعوا إسم هذا الشيء فقط لأنّهم لم يعرفوه. / فأمّا معنى الشيء فهم يستعملونه لأنّ كلّ الناس من العامة و ذوي التمييز قد يستعملون تقدمه المعرفة في الأشياء التي يمكنهم معرفتها و التحرّز من مكروه ما يخافون منها وإن لم يقدرُوا على دفع ذلك الشيء بعينه فإنّهم يدفعون عن أنفسهم كثيراً من الإذى و المكروه الذي يُصيبهم من ذلك الشيء بقدر الطاقة -

فأمّا بعض الناس فإنّما تكون تقدمه معرفته بالأشياء بالتجربة فيدفع عن نفسه مكروه ما تقدّمت معرفته له: و هم العامة - و بعضهم تكون تقدمه معرفته بالأشياء بانتقال الأزمنة و حالات الطبائع فيتقدّم في دفع المكاره بما تقدّمت له معرفته: و هم الأطباء - و أمّا بعضهم فإنّ تقدمه معرفته تكون بقوة أفاعيل الكواكب في هذا العالم فيتقدّم في دفع المكاره على قدر ما تقدّم من معرفته به: و هم المنجمون - فأمّا الذين تكون تقدمه معرفتهم بالتجربة فكألعامة فإنّها لما تقدّم علمها بالتجربة بوقت الحرّ أو بوقت البرد تقدّمت هي أيضاً في التوقي و الإحتراس منها قبل هجومها عليهم فأعدّت للحرّ التبريد و المواضع الباردة و للبرد السخين و المواضع الكينية و الأشياء / الحارة ليدفع إزائها عنهم بما يعدّون لهما من ذلك - و قد يرون في بعض الأوقات في السماء غيماً مخيلاً للمطر على قدر ما جربوا و هم في السفر أو في الحضر فيقدّمون قبل مجئ المطر إلى



المواضع التي تكتهم عن المطر عند مجئه او يتقدمون في جمل لباس يكتهم من المطر عند كونه - و إذا تقدم علم الإنسان أنّ عدوه يريد الهجوم عليه ، تقدم قبل ذلك ١١٣٥ الوقت في الإستعداد له بما يدفع عنه شرّ ذلك العدو عند هجومه عليه -

فكلّ العامّة لم يدفع ذات الشئ من حدوثه و لكنّها حين عرفت بالتجربة على طول الأيام او علمت ببعض الأسباب اوقات الأشياء التي تودهم تحرّزوا منها بما دفعوا به إزائها عن أنفسهم حتّى لم ينلهم مكروها لأنّ الذي علم أنّه يكون الحرّ أو البرد أو المطر في وقت كذا و كذا فتحرّز بالتقدّم فيما يدفع مكروهه عنه قبل هجومه عليه . ١١٤٠ فهو لم يدفع كون الحرّ ولا كون البرد ولا مجئ المطر و لكنّه لما تقدّمت معرفته به باوقاته بالتجربة إحتال لدفع مكروهه ذلك الشئ عن نفسه - فهذا و كثير مثله من هذا الجنس الذي تتقدّم فيه معرفة العامّة / بالتجربة و قد يستعدّون له قبل حدوثه و هجومه . وقد يستعمل تقدمة المعرفة بالتجارب جميع الصّناع في صناعتهم كأصحاب الزروع والغروس والرّعاء والنساء القوابل ويتقدّمون في التحرّز من المكاره التي يتخوفونها قبل هجومها عليهم . ١١٤٥

فأمّا الأطبّاء فإنّهم يستعملون تقدمة العلم بالأشياء من جهة إختلاف أحوال الزمان و تغيير الطبائع والإخلاط و يعرفون من هذا ما لا يعرفه غيرهم من جميع الصّناع الذين ذكرناهم أوّلاً لأنّ الأطبّاء قد يتقدّم علمهم بمنفعة العلاج في وقت أنتقال الأزمنة من حال إلى حال - وقد يتقدّم العامّة أيضاً في ذلك الوقت في إحراز الأبدان من العلل والأمراض لأنّه إذا كان في وقت الفصل الربيعي تقدّمت العامّة بما وجدت بطول تجاربها من تغيير مزاج أبدانها عند إنتقال الفصول في إحراز الأبدان من الأمراض و العلل بالعلاجات و تقدّمت الأطبّاء بتقدمة علمها بتغيير تلك الأبدان عند إختلاف الزمان عليهم فيما يستقبلون بسقى الأدوية والفصد وسائر العلاجات / خوفاً من أن يهجم عليهم الفصل الصيفي بحرارته فيجذّ في أبدانهم الأخلاط الرديّة العفنة الحادة فتجتمع حدّة تلك الأخلاط مع حرارة الهواء فيغلب على مزاجهم الحرارة المفسدة للأبدان فيمرضون . ١١٥٥ وكذلك يتقدّمون في العلاجات و التحرّز من الأمراض في كلّ اوقات السنة و أيامها فيتحرّزون في وقتهم ذلك ممّا يخافونه في الأوقات التي تستقبلهم عند إختلافها عليهم -

فقد طلبت العامة التحرز للأبدان من الأمراض بعلاج الأطباء لها و ذلك لما تقدم عندهم من العلم والتجارب أنّ كثيراً من الأبدان يعتلّ ويمرض عند اختلاف الزمان والطبائع ١١٦٠ عليها- وأيضاً فقد يكون بالإنسان العلة من فساد بعض الأخلاط فيهيّج به في وقت معلوم من السنة او من اليوم فيتقدم قبل هيجانها بالتحرز من ذلك المرض في استعمال الأدوية التي تخرجها او تنقصها او تسكنها فيدفع عنه أذى ذلك الخلط الرديّ كله او بعضه على ما يمكن في مثله -

47v

وقد يستدلّ أيضاً الطبيب ببعض أسبابه لتقدمة معرفته إذا رأى / أنّ بعض الأخلاط الرديّة قد ابتداء في الغلبة على بدن الإنسان ممّا يعلم أنّ مثله يدفعه العلاج او يسكنه فيتقدم في التحرز به من قوة ذلك الخلط الرديّ او الزيادة فيه بالعلاجات التي تسكن او تضعف قوته لأنّ لا يهيّج عليه و يهيّج معه بعض الأخلاط الرديّة فيعسر الحيلة في إخراجها او في تسكينها. فلو لا تقدّمت علم الطب بأنّ ذلك الخلط الرديّ إذا تركه على حاله هاج و ثار بالإنسان فاجعه و لم يتقدم في إخراجها او في تسكينه بتقدمة العلاج له . فقد يسكن الطبيب الحاذق بتقدمة المعرفة قوة الأخلاط الرديّة و يدفع عن الإنسان الأمراض و الوجع و السهر بما يتقدم فيه من العلم بعلاجه إيّاه و قد ينقص الفضول الرديّ من البدن او يخرجها منه حتّى لا يتأذى بها الإنسان . فإذا علم الطبيب ببعض ما يستدلّ به من الدلالات الصادقة أنّ ذلك المرض لا يذهب و أنّ صاحبه لا يبرأ و أنّه يموت في مرضه ذلك ، أخبر المريض بأنّه يتلف فيقدم المريض فيما يحتاج إليه ١١٧٠ في إصلاح أموره- فتقدمة معرفة المتطبّب / بالأمراض و العلاجات نافية جدّاً -

48r

و هذا الذي ذكرنا من تقدمه معرفة العامة و الأطباء بالأشياء إنّما أردنا بها القياس على صناعة النجوم لأنّ المنجم العالم إذا رأى في تقدمه العلم من قوة حركات الكواكب أنّ بعض الناس يصبّيه مكروه فأنّه يتقدم إليه بالقول في ذلك لأنّ تقدمه العلم من صناعة النجوم بما يصيب الإنسان من المكروه في الزمان المستقبل نافعة جدّاً و هيّ ١١٨٠ على خمس جهات ، واحدة منها عاميّة و أربع خاصيّة : [١] فأمّا الأولى فهيّ المكروه الذي إذا عرفه الإنسان فربّما أمكنه دفعه و ربّما لم يمكنه و هيّ عاميّة - [٢] و أمّا الثانيّة فهيّ المكروه الذي إذا تقدّمت معرفة الإنسان به ، قدر أن يدفعه عن نفسه بكنهه - [٣]



وَأَمَّا الثَّالِثَةُ فَهِيَ الْمَكْرُوهُ الَّذِي إِذَا تَقَدَّمَتْ مَعْرِفَتُهُ بِهِ قَدْرُ أَنْ يَدْفَعَ عَنْ نَفْسِهِ بِتَقْدِمَةِ الْعِلْمِ بِهِ بَعْضُهُ - [٤] وَأَمَّا الرَّابِعَةُ فَهِيَ الْمَكْرُوهُ الَّذِي يُعْلَمُ بِتَقْدِمَةِ عِلْمِهِ أَنَّهُ يَصِيبُهُ ، ١١٨٥ ثُمَّ يَزُولُ عَنْهُ بَعْدَ وَقْتٍ مَعْلُومٍ - [٥] وَأَمَّا الْخَامِسَةُ فَهِيَ الْمَكْرُوهُ الَّذِي إِذَا تَقَدَّمَتْ مَعْرِفَتُهُ بِهِ لَا يَقْدِرُ عَلَى دَفْعِهِ عَنْ نَفْسِهِ أَلْبَتَّةَ .

48v

[١] فَأَمَّا الْأُولَى الْعَامِّيَّةُ الَّتِي إِذَا تَقَدَّمَتْ / مَعْرِفَتُهُ بِهَا مِنْ عِلْمِ النُّجُومِ ، فَرُبَّمَا أَمَكْنَهُ دَفْعُهَا وَرُبَّمَا لَمْ يُمَكِّنْهُ - فَإِنَّمَا يُعْرَفُ ذَلِكَ مِنْ تَحَاوِيلِ سَنِيِّ الْعَالَمِ وَهُوَ كَالْوَبَا الْعَامِّيِّ وَكَالطَّاعُونَ وَالزَّلَازِلُ وَالْحُرُوبُ وَالْقَتْلُ وَالْقِتَالُ وَالْقُحْطُ وَهَلَاكُ الْبَهَائِمِ وَالْثَمَارِ ١١٩٠ الَّتِي تَعْمُ أَهْلَ أَقَالِيمٍ أَوْ مَدِينَةٍ - فَتَقْدِمَةُ الْعِلْمِ بِهَذَا وَشَبْهِهِ نَافِعَةٌ أَنَّهُ إِذَا تَقَدَّمَتْ مَعْرِفَةُ الْإِنْسَانِ بِذَلِكَ تَقْدَمُ بِالْتَحَرُّزِ مِنْهُ لِنَفْسِهِ وَلِغَيْرِهِ بِمَا يُمْكِنُهُ الْتَحَرُّزُ بِهِ مِنْ مِثْلِهِ قَبْلَ حَدُوثِهِ بِالْإِنْتِقَالِ وَالتَّحْوِيلِ مِنْ ذَلِكَ الْمَوْضِعِ وَبِمَا أَشْبَهَ هَذَا فَإِنَّهُ رُبَّمَا أَمَكْنَهُ أَنْ يَدْفَعَ عَنْ نَفْسِهِ مِثْلَ هَذَا الْمَكْرُوهِ بِمِثْلِ هَذِهِ الْحِيلَةِ وَ إِذَا لَمْ يَتَقَدَّمْ عِلْمُهُ فِي حَدُوثِ ذَلِكَ الشَّيْءِ ، ثُمَّ حَدَثَ إِشْتَدَّ فَرْعُهُ عِنْدَ حُلُولِ ذَلِكَ الْمَكْرُوهِ وَ لَمْ تُمْكِنِهِ الْحِيلَةُ فِي دَفْعِهِ عَنْهُ ١١٩٥ فَرُبَّمَا تَهَوَّرَ فِيهِ أَوْ كَالْقَوْمِ الَّذِينَ عَرَفُوا بِتَقْدِمَةِ عِلْمِهِمُ بِالنُّجُومِ أَنَّ عَدُوًّا لَهُمْ يَهْجُمُ عَلَيْهِمْ فَرُبَّمَا أَمَكْنَهُمْ دَفْعُهُ عَنْهُمْ بِالْحِيلَةِ وَ رُبَّمَا لَمْ يُمْكِنَهُمْ وَأَشْيَاءُ آخَرُ مِنْ هَذَا الْجَنْسِ .

49r

[٢] وَأَمَّا الثَّانِيَّةُ فَهِيَ الْمَكْرُوهُ الَّذِي إِذَا تَقَدَّمَتْ مَعْرِفَةُ الْإِنْسَانِ بِهِ يَقْدِرُ أَنْ يَدْفَعَهُ عَنْ نَفْسِهِ بِكُنْهِهِ وَإِنَّمَا يُعْرَفُ ذَلِكَ مِنْ مَوْلِدِ الْإِنْسَانِ أَوْ مِنْ تَحْوِيلِ سَنِيِّهِ أَوْ مِنْ مَسْأَلَةِ عَنْ حَالِهِ . وَهُوَ كَالْمَرَضِ أَوْ / ظَفَرِ بَعْضِ الْأَعْدَاءِ بِهِ أَوْ الْأَخْبَارِ الْمَكْرُوهَةِ أَوْ سَائِرِ أَنْوَاعِ الشَّرِّ ١٢٠٠ وَالْمَكْرُوهِ فَتَقْدِمَةُ الْمَعْرِفَةِ بِهِ نَافِعَةٌ جَدًّا كَمَا تَقْدَمُ قَوْلُنَا فِيهَا لِأَنَّهُ إِذَا رَأَى الْمُنْجَمُ بِتَقْدِمَةِ عِلْمِهِ أَنَّهُ يَهِيْجُ بَعْضَ النَّاسِ عِلَّةً مِنَ الْعِلَلِ فِي وَقْتٍ مَعْلُومٍ مِنَ السَّنَةِ أَوْ مِنَ الْيَوْمِ يُمْكِنُ دَفْعُ مِثْلِهِ بِالْعِلَاجِ أَخْبَرَهُ الْمُنْجَمُ بِذَلِكَ فَتَقْدَمُ ذَلِكَ الْإِنْسَانُ فِي الْعِلَاجِ وَالْأَدْوِيَّةِ بِإِخْرَاجِ تِلْكَ الْعِلَّةِ عَنْ بَدَنِهِ أَوْ تَسْكِينِهَا فَلَا تَهِيْجُ بِهِ تِلْكَ الْعِلَّةُ فِي ذَلِكَ الْوَقْتِ ، فَقَدْ دَفَعَ الْمُنْجَمُ عَنْ ذَلِكَ الْإِنْسَانِ مَكْرُوهَ تِلْكَ الْعِلَّةِ بِكُنْهِهِ بِإِخْبَارِهِ إِيَّاهُ أَوْ فِي مِثْلِ عَدُوِّ يَخَافُهُ ١٢٠٥ الْإِنْسَانُ فَيَرَى بِتَقْدِمَةِ مَعْرِفَتِهِ مِنَ الصَّنَاعَةِ النُّجُومِيَّةِ أَنَّهُ يَرِيدُ الْهَجُومَ عَلَيْهِ فَيَتَقَدَّمُ فِي الْتَحَرُّزِ قَبْلَ هَجُومِهِ . فَإِذَا هَجَمَ عَلَيْهِ لَمْ يَتَذَبَّ بِهِ وَدَفَعَ عَنْهُ مَكْرُوهَ بَكْنِهِ -

[ ٣ ] و أمّا الثالثة من المكروه الذي إذا تقدّمت معرفته به قدر أن يدفع عن نفسه بتقدمة العلم به بعضه فهو كإنسان الذي يخاف بتقدمة علمه النجوميّ أنّه تهيج به علّة من علل في بعض الأوقات فيتقدّم في العلاج قبل ذلك الوقت فيدفع عن نفسه عند ١٢١٠ هيجانه أكثر تلك العلّة بتقدمة العلاج له . و كإنسان الذي قد علم بتقدمة علمه بالنجوم / أنّ إنساناً ظاهر العدواة له يريده فيتحرّز منه بعض التحرّز فيدفع بذلك التحرّز القليل عن نفسه بعض أذى العدو -

49v

[ ٤ ] و أمّا الرابعة من المكروه الذي يعلم بتقدمة علمه أنّه يكون ، ثمّ يزول عنه بعد وقت معلوم ، فهو كإنسان الذي يعلم بتقدمة علمه النجوميّ أنّه يمرض أيّاماً معلومة ١٢١٥ ثمّ يبرئ ، أو كالعدو الذي يعلم أنّه يظفر به أيّاماً ، ثمّ يسلم منه ، أو كالحبس الذي يصيبه أيّاماً ، ثمّ تنحوّ منه -

[ ٥ ] و أمّا الخامسة من المكروه الذي إذا تقدّمت معرفته به لم يقدر على دفعه عن نفسه البتّة . فهو كإنسان الذي يعلم بتقدمة علمه النجوميّ أنّه مات في وقت كذا و كذا فتقدمة العلم به نافعة له لأنّه إذا تقدّم علمه به فأنّه يتقدّم فيما أراد من تهيّة ١٢٢٠ أموره و إصلاحها أو مصلحة الأمور فيما بينه و بين الناس بمثل ما يحتاج إليه في هذا المعنى فيؤتية الموت و هو عالم به و قد تقدّم في إصلاح ما يريد من أموره . و إن لم يتقدّم علمه في ذلك الحال به الموت ، و هو مختلف الحال مُتَشَتّت الأمر فيرجع ضرر ذلك على من يخالفه من ورثته و أهله و يذكر هو و عقبه بالمكروه على الأيّام المستقبلية . -

١٢٢٥ / فهذه القياسات التي ذكرنا تدلّ على أنّ تقدمة معرفة العلم بالأشياء من صناعة أحكام النجوم نافعة في جميع الأشياء - و أقول أيضاً أنّ تقدمة المعرفة بالأشياء المكروهة نافعة جدّاً لأنّه إذا ورد على الإنسان الشرّ بَغْتَةً إشتدّ جزعه و أدهشه و أختلس عقله و لم تمكنه الحيلة فيه و ربّما هاج عليه من شدّة الجزع عند حلول ذلك المكروه مكروه آخر و ربّما كان تركه التحرّز من ذلك المكروه يكسبه الزيادة في المكروه ١٢٣٠ و ربّما مات فجأة من شدّة الغمّ - فإذا تقدّم علمه بذلك المكروه قبل حلوله به

50r



ورد عليه ذلك وقد يرد جَلَدُهُ و وطن نفسه عليه و عرف سببه و قدّم ما أحتاج إلى تقديمه من التدبير بسببه و عمل في دفع ما يمكنه في ذلك عن نفسه فكان ايسر و أقلّ لذلك الشرّ. - فالْمُنْجَمُ الْحَانِاقُ بتقدمة علمه بالمكروه و إن لم يُمكن دفع ذلك المكروه كله فقد إحتال بتقدمة العلم به الدّفع ما أمكن من ذلك المكروه - -  
 ١٢٣٥ و الكواكب كما دلت على المكاره التي ذكرنا فأنّها دلت على التحرّز و المنفعة بسببه أيضاً و أنّ المنجّم بتقدمة علمه و إخباره للإنسان بوقوع المكروه به هو سبب التحرّز له -

فامّا الْحُجَّةُ الَّتِي تقرب من فهم العامّة في الردّ على الَّذِينَ قالوا أنّه ينبغي للإنسان أن لا ينظر في علم النجوم / لأنّه ربّما رأى في دلالات النجوم أنّ مكروها يناله إلى وقت من الأوقات فيتعجّل الإغتمام بعلمه في ذلك ثمّ يعقبه ذلك العلم الإغتمام به و الفكرة فيه إلى وقت حلوله به فهيّ أنّ أقول: لو كان الإنسان يَجْتَنِبُ إستعمال كلّ شئ يتعجّل الإغتمام بسببه لكان ينبغي له أن لا يسافر في طلب الفوائد والعزّ والسلطان لأنّه قبل أن يسافر يتعجّل الإغتمام لإخراج المال و النفقة بسبب ذلك السفر، ثمّ في سفره يتعجّل الغربة عن المنزل والتعب والإذى والمكاره والخوف على البدن والمال والحشم،  
 ١٢٤٥ و ربّما ناله في عاجل سفره بعض ما ذكرنا من المكروه قبل الظفر بشئ من الأشياء التي سافر فيها بسببها- وكان ينبغي له أن لا يصحب إنساناً لطلب الخير والفوائد والزيادة في الجاه والقدر لأنّه يتعجّل بذلك الوجه بطلب الوسائل لصحبة لذلك الإنسان، ثمّ يتعجّل الذلّ والهوان بسبب خدمته له قبل إنتفاعه به- وكان ينبغي له أن لا يأمّل شيئاً ولا يرجوه لأنّه إذا أمّل شيئاً ورجاه تعجّل الإغتمام بالفكرة والسعى فيه إلى وقت ظفره به  
 ١٢٥٠ فكلّ هذه الأشياء اللاتي ذكرنا وغيرها ممّا هو من هذا الجنس فقد يتعجّل الناس بسبب طلبهم إيّاه المكروه والإغتمام- و ربّما تلف أحدهم قبل الظفر بشئ ممّا طلب- فإن سلّم أحد منهم ببدنه وظفر بما طلب فقد تعجّل الغمّ والتعب الشديد والنفقة والخوف على المال والبدن وبذل الوجه والذلّ وكثيراً من المكاره والأذى فإن فاته ذلك معما قد تعجّل من هذه المكاره اللاتي وصفنا أعقبه الأسف والحسرة والندامة على ما  
 ١٢٥٥ إنفق من ماله وأتعب من بدنه بذل من جاهه وناله من أنواع المكاره، ثمّ لا حيلة له في ردّ ما أنفق من المال ولا في دفع ما تعجّل من الغموم والمكاره ولا ينفعه الأسف والندامة

على ما فات . و أما الإغتمام الذي يتعجّله الإنسان بتقدمة علمه من دلالات النجوم بالمكروه اللاتي يرى فيها إته يصيبه في وقت آخر و الإغتمام الذي يعقبه بسبب فكرة فيها إلى وقت حلولها به فأنه ينتفع بهما لأنه إذا تقدّمت معرفته من دلالات النجوم بالمكروه الذي يناله تفكر في الحيلة في دفعه و في إصلاح أموره كما ذكرنا فيعقب مقدمة معرفته بها و فكرته فيها دفع ما أمكن من ذلك المكروه-

و أيضاً فإنّ هولاء القوم لو تقدّمت معرفتهم من دلالات الكواكب أنّ الأشياء التي يطلبونها لا تتم لهم و لا يظفرون بها ، تركوا طلبها و الحركة و السعى فيها فلم يتعجّلوا المكروه و الإغتمام / و لا أعقبهم الحركة فيها الفكرة و الندامة و الأسف .- فمعرفة ١٢٦٥ الإنسان بالمكروه التي يصيبه ممّا يدلّ عليه النجوم نافعة جدّاً .-

و أقول أيضاً قولاً يقرب من فهم العامة في الردّ على القوم الذين زعموا أنّه ينبغي للإنسان أن لا ينظر في علم النجوم لأنّه بسبب معرفة ما يرى فيها من المكروه اللاتي يصيبه ، يعقبه الإغتمام إلى وقت حلولها به و لو كان الإنسان يجتنب إستعمال كلّ شيء يعقبه بسببه الإغتمام ، لكان ينبغي له أن لا يسمع الغناء أنّه عند سكوت المغني الحاذق ١٢٧٠ تعقبه الغم لإنقطاع السرور الذي كان فيه في وقت سماعه للغناء و كان ينبغي له أن لا يجمع النساء الذوات الصباحة و الجمال و أن لا ياكل اطيب الأطعمة و لا يشرب اصفا الأشربة و اجودها لأنّ في وقت فراغة من الجماع او في وقت إنقطاعه من الأكل و الشرب يعقبه الإغتمام لعجزة عن دوام لذة الجماع و الأكل و الشرب على قدر إغباطه بصباحة الجارية و جمالها و الإفراط في طيب الطعم و الشراب و كذلك يكون إفراط إغتمامه ١٢٧٥ بإنقطاع ذلك و عجزه عنه- و ينبغي له أن لا يقتني المال الكثير لأنّه يعقب كثرة المال الإغتمام بحفظه و يكسبه / الإعداء و الخساد و الخوف منهم- و ينبغي له أن لا يفرح بكثرة المال و الجواني عند كبر السنّ لأنّه لا يقدر في ذلك الوقت أن يتمتع بالجواني ، و لا يفرح بالمال فيعقبه بسبب عجزه عن الإلتذاز و الفرح به الإغتمام-

فإن يترك إستعمال علم النجوم لأنّه لا يأمّن أنّ يرى فيه مكروهاً فيعقب نظره فيه ١٢٨٠ و علمه به الإغتمام فينبغي له أن لا يستعمل شيئاً من هذه السعادات لأنّه يعقبه الغم



و الأسف و الحزن و الندامة بسبب انقطاعها و عجزه عنها و ينبغي أن يعمل نفسه في أكل  
ارداً الأطعمة و شرب ارداً الأشربة و ترك الجماع و إن جامع كان جماعه لأقبح النساء  
و اسمجهنّ ، و عند كبر السنّ يعمل نفسه في الفقر و في عدم كلّ شيء كما ذكرنا قبل من  
السعادات حتّى لا يعقبه الإغتمام لعجزه عن الإلتذاذ و السرور بها- فإنّما الأخير و السرور  
١٢٨٥ فإن تقدمة المعرفة بهما نافعة جدّاً لأنّه ربّما ورد على الإنسان الشئ السارّ بغتة فيدهش  
و يتحيّر و ربّما مات من ساعته من شدّة الفرح لأنّه من إفراط السرور او الغم ربّما مات  
الإنسان بغتة- فإذا حدث للإنسان السرور و قد تقدّم علمه به ، لم يدهش و لم يتحيّر لذلك  
و لا خيف عليه من شدّة الفرح ألتلف . و يتقدّم فكره فيما يريد من التديير فيه-

52v

و لنبيّن ما ذكرنا من الغمّ و السرور / بقياس مفهوم طبيعيّ في جميع الحيوان نقول  
١٢٩٠ أنّ الحيوان كله في طبعه يفرح و يغتمّ . فإذا لم يفرح الحيوان بما يفرح بمثله و لم يغتمّ  
بما يغتمّ بمثله كان بعيداً من الحيوانيّة و كان في طبع الأشياء الجامدة كالحجر و الخشب  
و ما أشبههما- فأمّا الحيوان كله غير الإنسان فإنّما يفرح و يغتمّ عند مباشرته للأشياء  
السارّة او الغامّة و إنّما بتقدمة معرفة السرور و الغمّ للإنسان وحده من بين الحيوان  
فتقدمة المعرفة بالأشياء النافعة و الضارّة يحتاج إليها الإنسان في كلّ الحالات . لأنّه  
١٢٩٥ إن كان ذلك الشئ مكروهاً فتقدمة العلم به خير له من تأخيره للعلل الّتي ذكرناها  
قبل . و إن كان خيراً او سروراً فأنّه لا يجهل إنسان فضيلته و إن تقدمة معرفته و تعجيل  
السرور بالإخبار عنه قبل كونه افضل من تأخيرها لأنّ كلّ الناس إنّما يسعون في هذا  
العالم ليسرّوا ، و غرضهم في السرور واحدة من ثلاث خصال : أمّا رجل مُغتمّ فهو يسعى  
في دفع ذلك الغمّ عنه و اجتلاب السرور-

١٣٠٠ و أمّا إنسان ناقص السرور فهو يسعى في تمام ذلك السرور- و أمّا إنسان مسرور ، فهو  
يسعى في دوام سروره . و أناتئ على السرور بقياس من جنس / الموسيقى [ أعنى الغناء ]  
و أقول أنّ لتقدمة معرفة الأخبار السارّة الّتي تدلّ عليها صناعة أحكام النجوم في النفس  
فعلاً عجباً لأنّه يظهر محموداً أفاعيلها كما يظهره سماع الغناء و ضرب الأوتار من مُغنى  
حاذق بالنغم عالم بتأليف الأوتار و إستعمالها لأنّ النفس كما يسرّ و يرتاح و يفرح

١٣٠٥ بأصوات الأوتار المولفة على الإستواء إذا سمعتها وتغير طبعها حتى يزيد ذلك في الشجاعة والسخاء وحسن الحلق فكذاك تقدمه المعرفة من صناعة النجوم بالإخبار السارة التي يتوقعها الإنسان كالولاية والظفر بالإعداد أو قنية المال وكون الولد قد يحدث فيه من السرور بأكثر مما يحدث فيه من سماع الغناء ونقر الأوتار، و كما أن تكرير صوت الأوتار يزيد في سرور الإنسان، فكذاك تكرير سماعة للإخبار السارة التي يتوقعها وفكرته فيها يزيد في سروره - و كما أن الإنسان إذا سُرَّ ببعض الأصوات يشتهي أن يسمعه مراراً كثيرة فكذاك يشتهي أن يسمع الإخبار السارة في كل وقت، و كما أنه يشتهي أن يسمع في كل وقت أغاني مختلفة بعضها احسن من بعض. فكذاك يشتهي أن يسمع في كل وقت إخباراً مختلفة سارة مما يستقبل يكون سروره بها أكثر / من سروره بالذي سمعه قبل ذلك إلا أن لتقدمة معرفة الإخبار السارة التي تكون في ١٣١٥ الزمان المستقبل من دلالة النجوم فضيلة ليست في الموسيقى [أعنى الغناء] و ذلك إن أصوات الأوتار المولفة على الإستواء إنما يسرّ بها السامع ما دام بسمعتها، فإذا سكن الموسيقى [أعنى المُنغني] انقطع ذلك السرور مع سكونه وتركه ضرب الوتر والخبر السار الذي يخبر به المنجم عن تقدمه معرفة صناعة النجوم - فإن صاحبه يسرّ به من حين يسمعه إلى أن ياتيه ذلك السرور . فلذلك يرغب الناس كلهم في تقدمه معرفة ١٣٢٠ الإخبار السارة من صناعة النجوم .

و أيضاً فإن من منفعة الناس بتقدمة المعرفة من علم النجوم بالأشياء أن يسأل السائل للمنجم الحاذق بالصناعة عن حال إنسان غائب أو هارب فيخبره بحاله فيستريح إلى ذلك أو يسأله عن مفقود قد فقد منذ زمانٍ و يخبر بقصة أهله لذلك فلا يدرون حي هو أو ميت فيخبرهم بما يرى من حاله فيعملون على حسب ذلك - أو يسأل عن مسافر ١٣٢٥ أو آبق لا يدري أي ناحية توجه فيخبرهم / بناحيته فيطلبونه هناك - أو يسأل عن الإنسان هل هو له على المودة أو على العداوة فيخبره بما يرى فيعامله على حسب ذلك - و مما ينتفع به في تقدمه المعرفة من علم النجوم أنه إذا ولد للإنسان مولود فإن علم أنه لا يتربأ لم يزوجه في صغره وإن لم يتقدم معرفته في ذلك، فإنه ربما زوجه ويموت المولود قبل بلوغ التربية فيقعون في تخليط -



١٣٣٠ فهذا و ما كان مثله من هذا الجنس كثير جدًا قد ينتفع بتقدمة معرفته من دلالات  
النجوم كلّ الناس - و قد ذكرنا فيما تقدّم منفعة العامّة بتقدمة معرفتهم بالأشياء  
بالتجارب و منفعتهم بتقدمة معرفة العلماء الأطبّاء باختلاف الزمان و تغيير الطبائع  
و العلاجات. و كذلك ذكرنا منفعتهم بتقدمة معرفة علماء أصحاب النجوم بما يظهر  
لهم من قوة حالات الكواكب في هذا العالم فقد بان و ظهر أنّ تقدم العلم بالأشياء  
١٣٣٥ نافعة جدًا لكلّ الناس إلّا أنّه في علم النجوم انفع و افضل و اشرف منه في صناعة  
الطبّ و في جميع الصناعات. فأمّا فضلها على سائر الصناعات فقد بيّناها قبل. و أمّا  
فضلها على صناعة الطبّ فإلعلّة فيها أنّ الأطبّاء إنّما يستدلّون على الأشياء بطبيعة  
الزمان و تغييره من حالٍ إلى حالٍ و بالأشياء الزائلة المتغيّرة و الملموسة. / فأمّا  
المنجمون فإنّما يستدلّون على الكائنات بالأجرام العلويّة و بما يحدث من قوة  
١٣٤٠ حركاتها في الزمان و الطبائع. و أيضاً فإنّ المنجم يستدلّ بما يكون إلى زمانٍ طويلٍ  
و ما كان منذ زمانٍ قديمٍ - و الطبيب إنّما يستدلّ على ما يكون في فصلٍ واحدٍ من  
فصول السنة او في ساعةٍ واحدةٍ من اليوم. فأمّا ما كان مضى فأنّه قلّ ما يمكنه  
معرفته-

و أقول أيضاً أنّ النفس افضل شيءٍ في الإنسان و هيّ تفرح بمعرفة الأشياء التي تكون  
١٣٤٥ و التي كانت و ليس في جميع الصناعات من المعرفة و العلم بالأشياء الماضية  
و الكائنة مثل ما في صناعة النجوم فصناعة النجوم إذاً افضل و تقدم المعرفة  
بالأشياء الكائنة منها انفع منه في جميع الصناعات -

--- تمّ القول الأوّل من كتاب المدخل بحمد الله و منه القول الثاني ---