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THEORETICAL AND PRACTICAL ASTROLOGY: PTOLEMY AND HIS COLLEAGUES

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Although Ptolemy was respected as a pathfinder of astrology and as a careful researcher, and although his *Tetrabiblos*, virtually the Bible of astrology, was copied, commented on, paraphrased, abridged, and translated into many languages, we have but little evidence to suggest the nature of his personal commitment to astrology as a practical system of forecasting.¹ To be sure, the

¹ References to the *Tetrabiblos* are to the book, chapter, and section number of the edition by F. Boll and Ae. Boer *Cl. Ptolemaei Opera Omnia* III 1 (Leipzig 1940) and the page number of the Loeb edition by F. E. Robbins (1940). The chapter numbers are not the same in the two editions. Works referred to by abbreviation are AG=A. Bouché-Leclercq, *L'Astrologie grecque* (Paris 1899) and GH=O. Neugebauer and H. B. Van Hoesen, *Greek Horoscopes* (Philadelphia 1959).

The astrological works cited in this paper:

Dorotheus Sidonius, *Carmen Astrologicum*. ed. David Pingree (Leipzig 1976). References are to the book, chapter, and section number of this edition, which contains an Arabic translation of the lost Greek original, an English translation (by Pingree) of the Arabic, and a collection of the Greek fragments. Dorotheus lived between 25 and 75 AD, judging from the dates of the horoscopes which he cites.

Firmicius Maternus, *Matheseos Libri VIII*. ed. Kroll, Skutsch, Ziegler (Stuttgart 1968). References are to the book, chapter, and section numbers. Firmicus, who praises Ptolemy's careful research (II *Praefatio*), was writing in 334 AD.

Hephaestion, *Apotelesmaticorum Libri Tres*. ed. David Pingree (Leipzig 1973). References are to the book, chapter, and section number. Hephaestion, who calls Ptolemy "divine," "a lover of truth" (1.3.1; 1.1.4), cites his own horoscope (2.1.32–34), which shows him to have been born in 380 AD.

Vettius Valens, *Anthologiarum Libri*. ed. Wilhelm Kroll (Berlin 1908). References are to the page and line number in this edition. A new edition by David Pingree is now available (Leipzig 1986). Valens lived until the 180's AD, judging from the dates of the horoscopes he cites. The horoscopes are translated (some only in part) in GH. The works of Valens, Hephaestion, and Firmicius are each some three times as long as the *Tetrabiblos*.

Porphyrus, *Introductio (Eisagoge) In Tetrabiblum Ptolemaei*. ed. Stefan Weinstock in *Catalogus Codicum Astrologorum Graecorum (CCAG)* V. 4, (Brussels 1940) 185–228.

Close to 50 manuscripts of the *Tetrabiblos* plus numerous fragments of the Greek text exist (see the preface to the text by Boll-Boer); a very close paraphrase of the *Tetrabiblos* is attributed to Proclus, the Neo-Platonic philosopher and lecturer (edition with Latin translation by Elzevir, Leiden, 1635); the *Karpas*, or *Centiloquium*, a collection of 100 aphorisms supposedly derived from Ptolemy's work, is an abridgement (edition by Ae. Boer, *Cl. Ptolemaei Opera Omnia* III 2. (Leipzig 1961); an Arabic translation was made in the ninth century and a Latin in the thirteenth.

doctrines of planetary influence, the portrayal of the stars' and signs' characteristics, and the general procedures found in the *Tetrabiblos* are quite similar to those found in all ancient astrological writings—both because Ptolemy drew on existing astrological tradition, and because later astrologers copied “the divine Ptolemy.” Nevertheless there is a core of specific doctrines and methods, not to mention an entire area of forecasting, common to the other astrologers, which is not included in the *Tetrabiblos*. I hope to illustrate these differences between the *Tetrabiblos* and the other astrological treatises and to suggest that these differences concern, for the most part, the day-to-day practice of the astrologer: Ptolemy omits the procedures for “Elections” (καταρχαί) and for “Interrogations” (ἐρωτήσεις), he makes little use of the Lots and the Places (explained below) and no use of numerical methods, of the “periods” of the stars, or of numerology of the type, for example, in which a person's fate is calculated according to the letters in his name. On the other hand, Ptolemy does include astrological predictions for the earth as a whole, astrological geography, and the effects of eclipses and planetary positions on the weather, matters of little concern to an individual inquirer. All this suggests that Ptolemy viewed astrology as he did astronomy, geography, and harmonics (the other sciences on which he wrote), i.e., as a strictly theoretical science, by the use of which the scientist can explain the interconnections between celestial and terrestrial phenomena and can trace the cause-effect relationships between the stars and the earth.

In contrast, the other ancient astrologers appear to focus on the day-to-day needs of their clients and can be identified as practicing astrologers: Vettius Valens, for example, a near contemporary of Ptolemy, certainly was a practitioner of this art, and for this reason I have frequently referred to his *Anthologies* in this paper. Valens cites sample nativities “which I had a hand in” (παρέτυχον—267.27, 268.28, 284.2). He addresses his disciple Marcus: “When you visit the many nations and climes of the world to display your talents there, you . . . will be glorified among the people as worthy of this heavenly art (=astrology), and when you have laid a foundation on the abundance of your knowledge, you will attain the status of treatise writer yourself” (359.14–20). With these words, Valens implies that he is training Marcus to be a practicing astrologer, and that eventually this promising student will compile treatises using the data and the skills which he has gathered during his career. Valens himself had done precisely that, having collected in the *Anthologies* some 130 partial or complete horoscopes which he himself (for the most part) had cast, and which he cites and discusses in order to illustrate his astrological doctrines and to prove their effectiveness. It is these very horoscopes which add much interest to his *Anthologies*.

Marcus was not Valens' only student. The astrologer gives directions to anyone who intends to cast horoscopes: they “must take into account the stars which control their own life,” so that they may not try forecasting when

their own stars are adverse and thus fall into avoidable error" (271.19–23). Valens clearly has the needs of the practitioner in mind.

The astrological practice of the other compilers discussed here cannot be ascertained so securely from their own explicit statements. Their writing style, however, may offer a clue: each writer phrases his instruction as a command to an astrologer casting a chart. A Greek fragment of Dorotheus on marriage says, "Declare that the husband is the sun and the Ascendant, the lovely maiden is the Descendant and fair-haired Kythereia" (5.16.1). The Arabic translation of Dorotheus seems to maintain this style: "Look at the cardine, the fourth. If you find Venus and the moon aspecting the cardine, the fourth, then predict regarding the mother an increase of good and a goodness of condition" (1.14.17). Hephaistion uses similar phrasing: "When investigating the freeing of slaves, assign the Ascendant to the one who is granting freedom, the Descendant to the freedman, Midheaven to the occasion for the manumission, and Lower Midheaven to the subsequent relationship between the master and the freedman" (3.21.1). Such phrasing implies that the reader will use these texts as handbooks when casting a horoscope. Ptolemy does not phrase his discussion in such a way, nor does he retail handbook methods of forecasting.

Assuming that the cited phrases and statements of Valens, Dorotheus, and Hephaistion give us some justification for viewing them either as practicing astrologers or as guides for practicing astrologers, I will now outline the differences between their methods and attitudes and Ptolemy's in order to confirm the validity of our initial impression that Ptolemy is concerned with the theory, not the practice, of astrology.

ELECTIONS AND INTERROGATIONS

A whole realm of forecasting, the Elections (καταρχαί) and the Interrogations (ἐρωτήσεις), is missing from the *Tetrabiblos*.² This branch of astrology investigates the influence of a momentary or temporary configuration of the stars on the beginning of some enterprise or voyage, the start of a partnership, and so on.³ Judging from the remains of the other astrologers, this was an important branch, much used by their clients. For example, Book 5 of Dorotheus (adapted in Hephaistion, Book 3) gives directions on how to forecast in response to particular inquiries: when to build or when to demolish a structure (5.6,7), when to buy land, slaves, or animals (5.10,11,12), when to begin a courtship (5.17). Dorotheus gives this *katarchē*: "It is best to lay the

² E. Boer notes without explanation Ptolemy's omission of the Elections, the Lots, and the Places in her discussion of the *Tetrabiblos* in "Claudius Ptolemaios," *RE* XXIII.2 (1959) 1831–38.

³ For a topic of Elections in general, see *AG* 458–86. Interrogations are a subdivision of Elections in which the astrologer simply answers specific questions: "Will the stolen money be recovered?" See *AG* 467–76.

foundations of a building if you build it when the Moon is increasing in computation and in light [i.e., waxing] and is in the middle of the zone which is the equator [=ecliptic], ascending toward the North while Jupiter or Venus is with the Moon or aspects the Moon from a strong place” (Dorotheus 5.6; translation Pingree). Of particular interest are the long chapters on discovering by astrological means the location of a lost or stolen object and a runaway slave. When asked if the lost or stolen object will be recovered, the astrologer should inspect the positions of the sun and the moon: if they are in trine (120° apart—a favorable aspect), then the forecast is for a quick and easy recovery. If the sun and the moon are in square (90° apart—unfavorable), then the recovery will come after a long time, with difficulty, after the thieves have moved the goods. If the sun and the moon are in opposition, then the recovery will again be slow and difficult (Dorotheus 5.35.1–3; Hephaistion 3.42.2–4). Alternatively, the astrologer can cast a chart and consider the Ascendant to represent the stolen goods, Midheaven (MC) to represent the owner of the goods, the Descendant to represent the thief, and the Lower Midheaven (IC) to represent the place where the goods are hidden. If in this particular chart the benefic stars are in the Ascendant or aspect the Ascendant, then the astrologer forecasts that the client will recover the property. If IC (=the place where the goods are hidden) is in a bicorneporeal sign, then the property belongs to two individuals; if IC is in a masculine sign, the property belongs to a man; if in a feminine sign, then to a woman; if IC is in a moist sign, the property is located near water; and so on in great detail for two pages (Dorotheus 5.35.20–27; Hephaistion 3.42.23–31).⁴

One can rest assured that the practicing astrologer (like today’s psychics summoned to a criminal investigation) met the challenge of such inquiries daily. Ptolemy has nothing on the Elections. In the concluding paragraph of Book 4 he leaves the determination of the “kinds of effects produced (by the stars) at any particular time” to the skill of the astrologer who knows the situation of the client (4.10.27; Robbins 458). In a theoretical treatise, such forecasts go “beyond the bounds of the possible” (3.6.1; Robbins 250).

THE LOTS

When forecasting, most astrologers used the Lots and the Places. The Lots (κλήροι) are specific degree positions of the zodiac, found by calculations based on the longitudes of the stars and the Ascendant:

1. The Lot of Fortune (κλήρος τύχης) is universally used. It is found by measuring the distance from the sun to the moon, then counting that distance off counterclockwise from the Ascendant. If for example the sun is at Aquarius 1°, the moon at Gemini 1° (120° away), and the

⁴ For the manifold and overlapping classifications of the signs see *AG* 149–57.

Ascendant is at Cancer 1°, then the Lot of Fortune would be at Scorpio 1°, 120° from the Ascendant.⁵ (See diagram #1, page 256.) The identical procedure is used to find all Lots; only the positions differ from which and to which the counting is done. Less common are the other Lots, including the following:⁶

2. The Lot of Daimon (κλῆρος δαίμονος), which also uses the distance from the sun to the moon, but is counted clockwise from the Ascendant. Hence it is symmetric to the Lot of Fortune with respect to the Ascendant.

3. The Lot of the Father—the sun to Saturn (Dorotheus 1.13).

4. The Lot of the Mother—Venus to the moon (Dorotheus 1.14).

5. The Lot of Brothers—Saturn to Jupiter (Dorotheus 1.19).

6. The Lot of Marriage—Venus to Saturn (Dorotheus 2.4).

7. The Lot of Children—Jupiter to Saturn (Dorotheus 2.10).

8. The Lot of Friendship—the moon to Mercury (Dorotheus, page 433–4).⁷

These points on the zodiac served as reference indicators for interpreting specific questions of marriage, luck, friendship, and so on. To cite an example of the method used: Dorotheus finds the Lot of the Father by counting the degrees from the sun to Saturn, then measuring off this distance from the Ascendant. He next examines the position of the Lot. If the star which rules this place is well or badly situated, the father's affairs will go correspondingly (1.13). The particular nature of the ruling star reveals the father's character: Saturn=slow, cold, mocking; Mars=fiery, swift as the wind; Jupiter=lofty, regal; Venus=golden, graced with garlands; Mercury=keen, swift, glowing.⁸ It is simple to use and interpret the Lots.

A similar type of simple numerical method is found in Hephaistion 2.4.25 (=Dorotheus 1.14.4). To forecast about the mother, find the hour of birth, count off the number of the hour from the sun's sign, taking each sign as one. For example if the birth was at the second hour of the day (approximately 8:00 a.m.), and the sign in the Ascendant was Aries, the astrologer would count two signs from Aries to Gemini, note the last sign counted, treat it as the Ascendant, determine the new angles and other relationships, and use these to forecast the mother.⁹ Such numerical manipulation yields additional points on the zodiac for the exercise of the astrologer's ingenuity.

Ptolemy seems to avoid these simple counting methods and makes little use of the Lots. Of them all, he mentions only the Lot of Fortune: "When the stars which rule the Lot of Fortune are in power, they will make the client

⁵ There are variations in the procedure. This is Ptolemy's version. See *AG* 289–93, *GH* 8.

⁶ For all of these, see *AG* 288–308 and *GH* 8–9.

⁷ This is a Greek fragment not surviving in the Arabic translation.

⁸ The epithets are from Dorotheus (Appendix III, page 435).

⁹ Similar counting in Hephaistion 2.10.37–40.

rich” (*Tetrabiblos* 4.2.2; Robbins 374). Stars in favorable aspect with the Lot of Fortune indicate good results: receiving inheritances (3.4), brothers in harmony (3.5), intense friendships (4.7), long and successful residence abroad (4.8). Ptolemy views the Lot of Fortune as a “lunar Ascendant,” i.e. a hypothetical Ascendant in the same geometrical relationship with the moon as the actual Ascendant is with the sun. See diagram #1, page 256.¹⁰

Hence it is one of the significant points of the zodiac along with the degree-positions of the stars and the Angles (Ascendant, MC, Descendant, IC). Because he ignores the other Lots, his method of forecasting requires the evaluation of the configurations of the stars with the significant positions in the zodiac. To evaluate the father Ptolemy requires the astrologer to look at the positions of the sun and Saturn:

- 1) The father’s wealth can be seen from the “attendance” of the stars on the sun: the proximity of many stars to the sun indicates wealth; of no stars, poverty;¹¹
- 2) The father’s length of life is determined from the configurations of Jupiter and Venus (=a long life) or of Mars (=a short life) with Saturn, plus Saturn’s configuration with the sun and the angles;
- 3) The father’s injuries and diseases can also be determined using similar methods. Ptolemy refers the reader to the later chapters on these topics (3.12 and 4.9).

Ptolemy takes almost six pages to discuss the procedures and the possibilities, compared to Dorotheus’ brief paragraph (1.13). The harried astrologer wanted an easier method. To cite another example: at the end of chapter 4.3, “The Fortune of Rank” (Robbins 376), Ptolemy mentions that the gradations of rank and their changes are very many and then gives general rules for their estimation: if the attending stars are benefic or of the same sect, the prospects are good; if the opposite is the case, the prospects are bad. He then notes the overall influence of the attending stars (4.3.5–6; Robbins 380). Hephaistion omits this passage. He wants definite rules and finds them in Dorotheus and in the “Ancients”: “If the Lot of Fortune is in a bad place and if the benefics are out of aspect with the moon, and if the malefics are at or just following centers, then the subject will be unlucky” (2.18.11). Such instructions require mere inspection of the chart; little chance for malpractice here!

¹⁰ The Ascendant is the point on the horizon at birth. Judging from the position of the sun in the diagram on the left, the time of birth was about 2:00 p.m. When the chart is rotated (diagram on the right) to place the Lot of Fortune in the Ascendant’s position, we see that the moon is now in the sun’s previous position. Hence Ptolemy calls the Lot a “lunar horoscope” (3.11.5; Robbins 276).

¹¹ For the concept of “attendance” see *AG* 252–4. A similar scheme is found in *Tetrabiblos* 4.3, where the attendance of all five planets on the sun and the moon indicates a royal birth; the attendance of fewer indicates a birth of lower rank.

THE PLACES

Related to the scheme of Lots is the system of the XII Places (τόποι).¹² Both are means for fixing certain points of the zodiac by the inspection of which information of value to the client can be gained; this system is an essential part of astrological interpretation to this day. In ancient astrology the Places are determined by dividing the zodiac in twelve 30° segments, beginning at the degree in the Ascendant. See diagram #2, page 256.

Each Place has a name and is associated with some sphere of life:

- I. The Ascendant—life, the spirit, the body.
- II. The Gate of Hades—possessions, business.
- III. The Goddess—friends and relatives.
- IV. IC (Imum Caeli, Lower Midheaven)—parents, reputation.
- V. Good Fortune—children, friendship.
- VI. Evil Fortune—illness.
- VII. The Descendant—marriage.
- VIII. Death—death, inheritances, trials.
- IX. The God—religion, travel, prophecy.
- X. MC (Midheaven)—career, honors, reputation.
- XI. Good Daimon (Ἀγαθὸς δαίμων)—benefits, accomplishments.
- XII. Evil Daimon—enemies, slaves, infirmity, death.

Note that the Places overlap the twelve zodiacal signs but are not identical to them: a Place may extend over parts of two signs.

Use of the Places simplifies the determination of a star's or a Lot's influence. To return to the example cited above: when describing the Lot of the Father, Dorotheus states, "Prevent [=God forbid] that it [the Lot] be in the VI, the VIII, the III, or the XII Place as these four Places are bad" (1.13.4). Or, when discussing the inheritance of the father's property, he says, "If you find the sun in the VI or the XII Place, then similarly it indicates the loss of the father's property" (1.16.6) (The sun generally represents the father—see 1.12.15.). The malign values assigned to these Places are obvious from the preceding list, except the one assigned to the III Place—this is puzzling to me. Such use of the Places frees the astrologer from reference to the whole paraphernalia of houses, exaltations, terms, and decans used in zodiacal forecasts.¹³

Ptolemy rarely uses the Places, and his method of referring to them is at variance with customary usage. He first mentions them in 3.10 "Length of Life" (Robbins 270), where he describes five of the Places, adding their names:

- I. "The twelfth part [of the zodiac] which surrounds the [degree in the] Ascendant;"

¹² AG 276–88. Variants exist; see the introduction to Goold's edition of Manilius in the Loeb series (lx–lxi) for corrections to the discussion on AG. The Places are called Houses or Temples in modern usage; GH refers to them as Loci (GH 7–8).

¹³ AG 274.

XI. "The part sextile to the right, called 'The Good Daimon;'"

X. "The part square, MC;"

IX. "The part trine, called 'The God;'"

VII. "The part in opposition, the Descendant."

Of most significance is Ptolemy's way of defining these Places. Their essence lies not in any inherent mythical qualities, but in their geometrical relationship with the Ascendant: conjunction (I Place—the Ascendant), sextile (XI Place), square (X Place—Midheaven), trine (IX Place), opposition (VII Place—Descendant), i.e., the five standard aspects. He specifically rejects the use of the VIII and the XII Places, again for geometrical reasons: neither is in aspect with the Ascendant, the VIII Place being disjunct (ἀσύνδετον), and the XII Place (which is also disjunct) because it hinders the emanations from the stars to the earth by its "murky" character (3.11.4; Robbins 274).

In the *Tetrabiblos* these Places serve only as the possible locations of the "aphetic point," the degree position of the celestial body which is taken to represent the client's life when calculating the length of life.¹⁴ They are not used for predicting children, marriage, or any of the other activities traditionally associated with them (see pages 247–8).

NUMERICAL METHODS

The discussion of the Lots above made it clear that the astrologer did much counting of signs and degrees, much measuring off from one star to another to fix the Lots used in his interpretations. Ptolemy will have none of this—he rejects forecasting "by Lots and numbers which cannot be logically derived" (3.4.4; Robbins 236)—and in fact performs very few calculations in the *Tetrabiblos*. This absence of mathematics in the *Tetrabiblos* may seem surprising, since it is clear that Ptolemy performed a great number of trigonometric and square root calculations in constructing the tables of the *Almagest*. Why then so little in the *Tetrabiblos*? 1) Ptolemy does not assume the astrologer needs to calculate star positions from scratch and he does not give directions for doing so; other astrologers did. 2) Ptolemy does not use the simple counting procedures such as those illustrated above for the Lots, nor does he engage in numerology. 3) He assumes a higher competency on the part of the reader than do the other writers; indeed the extent of explanation felt necessary by Vettius Valens is positively embarrassing. And 4) he shuns astrological topics which require the use of numbers, perhaps because he considers geometry to be the only truly scientific branch of mathematics.

¹⁴ In length-of-life calculations, the client's life is represented as a point on a wheel (=the zodiac). It starts rotating at the aphetic point (=birth) and finds itself arrested at the anaeretic point (=death). The number of degrees or rising times between the two points equals the number of years of life. The actual aphetic point can be the sun, the moon, the Ascendant, or the Lot of Fortune, but it must be in one of the five specified Places. See AG 413–19 and Robbins' notes on *Tetrabiblos* 3.10.

A typical arithmetic procedure from Vettius Valens' *Anthologies* will illustrate point 1). In Book 1 (29.24–30.6) Valens shows how to find the position of the moon's ascending node (the degree at which the moon crosses the ecliptic moving in latitude from south to north):¹⁵ "Take the completed years from Augustus and multiply them by $19^{\circ}20'$. [Multiply] each additional month [in the current incomplete year] by $1^{\circ}35'$. [Multiply] each additional day [in the current incomplete month] by $3'$. Divide the total by 360° . Count off the remaining degrees and minutes clockwise from Cancer, giving 30° to each sign. The resulting degree position is the ascending node" (29.25–30). Valens sets the epoch for the calculation as Thoth 1 in the first year of Augustus' rule (August 29, 32 BC) with the ascending node in Cancer on that date.¹⁶ Each year its position moves $19^{\circ}20'$ and of course $1/12$ of that per month ($1^{\circ}35'$) and $1/360$ per day ($3'$). The astrologer calculates the total motion and counts the total from Cancer to find the current position. Valens characteristically gives an example: find the ascending node for Phamenoth 19, year 4 of Hadrian (March 18, 120 A.D.). This is 148 years, 6 months, and 19 days from the epoch. Valens explicitly multiplies 148 times $19^{\circ}20'$ and gets 2862° . He then multiplies 6 months times $1^{\circ}35'$ plus 19 days times $3'$ and gets 10° . The grand total is 2872° . He divides by 360° for a result of 7 and a remainder of 352° , the desired answer. He counts this off clockwise from Cancer and comes (correctly) to Leo 8° .¹⁷

There is nothing like this in the *Tetrabiblos*. The reason, of course, is that the *Tetrabiblos* is really Volume Two of a long work on astronomy of which the *Almagest* is Volume One.¹⁸ Ptolemy himself distinguishes two types of astronomical forecasting: the first in order and precision is the method for forecasting the motions of the stars (=astronomy, the *Almagest*); the second is the method of forecasting the effects on the earth of these motions (=astrology, the *Tetrabiblos*). The type of calculation just cited from Valens had already been done in the *Almagest* and may have been available in the

¹⁵ Since there is as yet no English translation of this work and since the text is far from transparent to the uninitiate (as Valens certainly wished it to be!), I will quote at length.

¹⁶ Thoth and Phamenoth are two of the twelve Egyptian months universally used by astronomers. Each month has 30 days; each year has five leap days for a total of 365 days. The "epoch" is the date at which all calculations begin; for example, the epoch of our dating system is 1 January, 1 AD.

¹⁷ With some rounding off. This passage is discussed in O. Neugebauer, *A History of Ancient Mathematical Astronomy* (Berlin: Springer-Verlag, 1975) 826–27.

¹⁸ The *Almagest* is probably Ptolemy's earliest work, surprisingly enough in view of its detail and sophistication—of course his immediate predecessors are unknown. His *Planetary Hypotheses* quote the *Almagest* (*Op. Min.* 72.7); the *Planisphaerium* refers to the *Almagest* (*Op. Min.* 234.16); the *Handy Tables* are a revision of the *Almagest*'s tables in the interest of simpler procedures; and, most important here, *Tetrabiblos* 1.1 (Robbins 2, line 16—κατ' ἰδίαν σύνταξιν) refers to the *Almagest* directly. His *Geography* was in the planning stage when Ptolemy was writing the *Almagest*, since he refers to such a treatise as one for the future (*Almagest* 2.13). See Neugebauer, *A History of Ancient Mathematical Astronomy*, 834–38.

Handy Tables ready for use.¹⁹ In contrast, Valens assumes the astrologer must calculate everything from scratch. He gives procedures for finding the planetary ruler of the day: find the total number of days from the epoch, divide by 7, count the remainder starting with the sun in the order sun, moon, Mars, Mercury, Jupiter, Venus, Saturn (26.12–16. This is the origin of our week); and for finding planetary positions (33.19–36.27). These procedures are necessary for the astrologer who lacks reference tables or who wants to understand the derivation of the tables. Indeed, Valens describes in detail the construction of the length-of-life tables used in Book 8 (295.1–296.14).

The methods used in the preceeding examples had astronomical justification. The same cannot be said for other counting procedures, which become mere numerology—the second difference between the mathematics of the *Tetrabiblos* and that of the other astrologers. These procedures use the “periods” of the stars and the “rising times” of the signs. Each star has associated with it a “period”:

Sun—19	Moon—25
Mercury—20	Venus—8
Mars—15	Jupiter—12
Saturn—30	

Some of these numbers have astronomical significance, but they are generally used with numerological methods. Thus the 19 years of the sun may be 19 years, 19 months, 19 days, even 19 hours.²⁰

The signs too have numbers attached to them. These are the rising times, varying from 15 to 45 in the different latitudes, or *klimata*.²¹ Unlike the periods of the stars, the rising times are astronomically significant; they are nevertheless used numerologically. The following example uses the planetary periods and the rising times: citing a horoscope from December 4, 122 AD, Valens demonstrates one method for the “distribution of the chronocratorships,” the procedure by which the star ruling a particular year of the client’s life can be determined.²² After specifying the stars’ positions in the natal chart, Valens says: “His wife died in his 34th year: 19 for Leo and 15 for

¹⁹ For the nodes see *Almagest* 4.4 and *Handy Tables*, *Op. Min.* 171.7–20 with the now lost accompanying tables. A version of these tables is available in W. Stahlman, *The Astronomical Tables of Codex Vat. Gr. 1291* (Brown Dissertation 1959) 260–62. I do not mean to imply that the *Handy Tables* as such were constructed before the *Tetrabiblos* was written; the possibility that they could be constructed may certainly have been envisioned.

²⁰ See *GH* 10–11 for the derivation of these numbers. Their astronomical significance is not essential, perhaps not even relevant. Valens and Firmicius use other periods as well. See Valens 164.5–30; Firmicius 2.25.

²¹ For an explanation of the astronomical significance of the rising times, see *GH* 3–5 and *AG* 262–69.

²² *AG* 491–98.

Scorpio or for Mars itself [total 34]. Both malefics surrounded Venus. In his 36th year, because he was suspected of plotting against his wife he was accused and was scheduled to go on trial before the emperor—but he fled. 36 is the rising time of Leo and of Scorpio, where Venus was located (in the natal chart), dominated by Saturn. The next year, his 37th, was much better: 12 for Jupiter and 25 for the moon in opposition [to Jupiter]” (268, 18–26). This interpretation of a horoscope is typical of dozens in Valens. Periods are added to periods, rising times to rising times, periods to rising times: anything necessary to derive significant numbers. In this particular horoscope, 34 is derived from “19 for Leo” and “15 for Scorpio or for Mars itself.” Leo is the house of the sun, whose period is 19. Scorpio is the house of Mars, a malefic whose period is 15. In the natal chart Venus is in Scorpio, so at $19+15=34$ years something bad happens to a female personage, here the wife. Rising times of these signs could have been used, but they would not have given the right answer. (Valens knew the required year in advance. These horoscopes are all retrospective.) Rising times do give the next significant number, 36, so now 36 is associated with Leo and Scorpio (still indicating trouble because of the wife), not 19 and 15. For the next year, 37, periods are again used: “12 for Jupiter and 25 for the moon,” both being benefics, hence promising better things. Horoscopes for children exist in which the periods are interpreted as months, not years (170.15–171.3; 284.12–285.3). In contrast, Ptolemy has only a brief discussion of the planetary periods, and he gives no examples or interpretive methods (4.10; Robbins 436).

Third, Ptolemy expects a basic mathematical competency from his students. Others did not. Several passages from Book 1 of Vettius Valens’ *Anthologies* reveal the usual low level of mathematical talent. In chapter 7, Valens gives the rule of finding how many equinoctial (=clock) hours a sign takes to rise: “For example, Aries’ rising time is 20. Now an hour contains 15 equinoctial ‘times’ [=4 minutes each]. If you subtract 15 from 20, the result is 5, which is $1/3$ of 15. Therefore Aries rises in $1\frac{1}{3}$ hour” (23.18–21). Each step for reducing $20/15$ must be given. In chapter 19, Valens requires the student to divide by 3: “Having looked up the factor for each emperor for the year in question, divide it by 3, noting the remainder instead of discarding it. If the remainder is one, add 300 to the number. If it is two, add 20. If it is three, *add nothing—the number divides evenly*” (31.15–23). In chapter 23, Valens needs to find the date of conception for a birth which occurred in the Egyptian month Messori, day 6. The gestation period is assumed to be 280 days 12 hours. He explains how to subtract 280 days 12 hours from Messori 6: “We must subtract this period from the $365\frac{1}{4}$ days of the year. The result is 84 days 12 hours [sic—the figure should be 18 hours]. So if we add this to Messori 6 [viz. of the previous year], we come to Phaophi 27, the 23rd hour—which is the date of conception. To check: if we take the period from Phaophi 27 to Messori 6, it will be 280” (50.28–32). Every step in the calculation must be spelled out.

Such explicitness seems far from the Ptolemy of the *Almagest* or of the *Handy Tables* (although of course we cannot know what preparation Ptolemy expected of his students—if indeed he had any), but it was necessary for later students of astronomy. The one example of long division worked out survives in Theon's *Commentary on the Syntax* (= *Almagest*) of Ptolemy. The same *Commentary* contains an example of the extraction of a square root in addition to many quite elementary explanations.²³ Not only does Ptolemy expect mathematical competence, he also assumes the reader knows basic astronomy and astrology: he does not define the terms “aspect” (μαρτυρία), “attendance” (δορυφορία), “dominant aspect” (καθυπερτέρησις), or “rejoicing” (χαίρειν), to cite just four common astrological terms which are explicitly defined in Porphyry's *Introductio*, a work which gives the reader all the information needed to read the *Tetrabiblos*,²⁴ nor does he systematically list all the “facts” about the stars and signs, in contrast with Valens and Hephaistion, who each begin their works with many pages describing the attributes, effects, and dominions of the stars and signs.²⁵

Finally, Ptolemy seems to avoid topics which would require the use of numerical parameters, however frequently these were used by others. Other astrologers cite standard lengths of the gestation period: maximum—288 1/3 days, mean—273 1/3 days, and minimum—258 1/3 days, for normal nine-month infants.²⁶ These periods are necessary for calculating the date of conception from the date of delivery. Hephaistion has seven pages on this topic (2.1); Ptolemy has none. Likewise the moon's position on the first, third, seventh, and eleventh (Firmicus 4.1.7–10) or the third, seventh, and fortieth (Valens 29.5–23) days forecasts good or bad fortune depending on its aspects. Such numerical specification seems alien to Ptolemy's scientific style, and may be one reason he avoids using the periods of the stars, which were mentioned above. He prefers to realize his forecasts according to the nature of the signs and stars and their geometrical interrelationships, a cause “nobler by far” than any other.²⁷

²³ The examples are in Ivor Thomas, *Greek Mathematical Works* I (London 1939) 50–60. For the nature of the commentaries by Theon and Pappus on the *Almagest*, see O. Neugebauer, *A History of Ancient Mathematical Astronomy* 968.

²⁴ The *Introductio* also contains methods derived from other astrologers, sometimes contradicting Ptolemy's text: its explanations of the exaltations (CCAG V.2, page 196), the assignment of stars to the day or night sect (196), the operative signs (209), the sign of conception (210), the Lots as indicative of illness and injuries (223), the four ages of life derived from the four Angles (225) are inconsistent with Ptolemy's system.

²⁵ The descriptions in Hephaistion 1.1–2 comprise 32 pages. Valens has 19 (1.1–19.6), with several pages missing at the very beginning.

²⁶ These are the customary figures, but as usual variations abound. The passage just cited from Valens uses 280½ days as the maximal period—if the moon is in Libra!

²⁷ The quote is from Johannes Kepler, “On the More Certain Fundamentals of Astrology. Prague 1601,” ed. and trans. J. B. Brackenridge and M. A. Rossi, *Proc. Amer. Phil. Soc.* 123,

ORGANIZATIONAL PRINCIPLES

Ptolemy's theoretical approach to astrology is in sharp contrast to the approaches of the other astrologers. His preferred principle of organization is clear. He begins with the basic physical principles from which all phenomena can be derived: the four *humors*, heat, cold, moist, dry, from which the nature and effects of the stars and signs, as well as the nature of the inhabitants of the earth's climes, can be derived, and the favorable or unfavorable *aspects*, the angular relationships of the stars and signs with each other and with significant points in the zodiac: conjunction (0°), sextile (60°), square (90°), trine (120°), opposition (180°). Through the application of these basic "scientific" laws, he demonstrates the mechanism by which the stars exert their influence on the environment and on human life. For example, Jupiter, Venus and the moon are beneficial stars, helpful in a nativity, while Saturn and Mars are harmful and destructive. (The sun and Mercury can be either.) Ptolemy explains the reason: heat and moisture create life, while dryness and cold destroy it. Therefore the warm and moist stars, Jupiter, Venus, and the moon, are creative and nourishing; the dry and cold stars, Mars and Saturn, are destructive (1.5.1; Robbins 38).²⁸

Quite different approaches were used by the other astrological writers, who are concerned with practical matters. Dorotheus begins, not with a proof of the validity of astrology or a description of the universe, but with instructions for forecasting births, the native's status, the native's parents' status, his brothers, and so on—in short, forecasts for matters connected with the beginning of life. Book 2 is devoted to marriage, Book 3 to length-of-life calculations, and Book 4 to a related topic, the distribution of the chronocratorship, which can affect the onset of good or bad fortune, chronic illness, or other dangers. So far Dorotheus has presented the means of forecasting the general lifespan. Book 5, perhaps the most interesting, is devoted to the *καταρχαί*, the Elections, examples of which were mentioned above: the propitious times for buying and selling, courtship and marriage, travelling and returning. Forecasting the outcome of illnesses falls in this category. Thus, generally speaking, Dorotheus' work is organized by types of forecasts: gen-

no. 2 (1979) 96. Geometry was more noble than arithmetic: the latter was of advantage in the "arrangement and movements of armies and expeditions, and in the management of a household" (Plato, *Laws* 819c, trans. Jowett), but the inscription over the porch of the Academy said: "Let no one unversed in geometry enter my doors." Plato is also reported to have said that God is always geometrizing (Plutarch *Quaest. conv.* 718b). In addition, the "arithmetic" of Nicomachus' *Introduction to Arithmetic* (ed. Hoche [Leipzig 1866]); passages translated in Thomas, *Greek Mathematical Works* I 73f) is number theory—squares, cubes, primes, means, polygonal numbers—not methods of calculation. I suspect that for Ptolemy arithmetic in our sense was merely utilitarian; geometry is the basis of the universe's arrangement.

²⁸ For the characteristics of the stars, see *AG* 88–101.

ethliology—forecasts for individual lifetimes, and Elections—forecasts for specific inquiries.²⁹

The *Anthologies* of Vettius Valens is organized, in so far as it can be called organized at all, not according to the astrological principles of interpretation, but according to the categories of questions that might be asked, with heavy stress on the distribution of the chronocratorship and the related topic of “critical (or climacteric) years.”³⁰ The approach is in most cases severely empirical: Valens cites his horoscopes as evidence for the validity of whatever astrological procedures is under discussion.³¹ The example quoted above (pages 244–5) is used to prove the efficacy of the critical year calculations. The numbers predict the events perfectly! Three centuries later Firmicus does the same. However, the reader’s confidence in the value of Firmicus’ horoscopes as evidence is shaken when he notices that the horoscopes cited are those of two fictional characters in the poems of Homer—Paris (who carried off Helen of Troy) and Thersites (the rabble-rouser)—plus the horoscopes of Homer himself, Plato, Pindar, Archilochus, and Archimedes, all of whom lived before the development of horoscopic astrology.

Related to this attempt at “empirical” proof is the tendency for the other astrologers to retail exhaustive lists of possible configurations and their meanings. The example quoted above (page 238) from Dorotheus on stolen goods is a typical example of an attempt to list all, or nearly all, possibilities. I suppose the budding astrologer could be imagined using these lists like a Math Tables book to find the relevant configuration and its meaning. For further illustration of this point, I cite a passage from Vettius Valens. His third book begins with a chapter on the “control,” the attempt to determine which star rules the chart. After two paragraphs of general discussion Valens begins listing the possibilities:

These systems (of control) have been tested by us. The first control comes when the sun is in Leo and the moon in Cancer.³² The sun will have the control when it is at that time in the Ascendant or at MC, and the ruler of the term (in which the sun is located) will have the rulership. If both the sun and moon are in the terms of the same star, that star will unquestionably be considered the ruler. The second

²⁹ At least the surviving parts of the poem—some sections have not survived in the Arabic translation. The “antiscia” for example are attributed to Dorotheus by Firmicius, but are not in the existing text. Fragments of the missing passages are edited in the Appendices to Pingree’s edition, pp. 426–37.

³⁰ Critical years are those in which the client should be particularly cautious. In one system such years are divisible by 7 or 9; hence the 63rd year is especially dangerous. I estimate that some 80% of Valens’ Book 4 through 9 (pages 158–363) are devoted to these topics, of obvious interest to his clients.

³¹ *GH* 176.

³² Leo is the house of the sun, Cancer the house of the moon.

control: when the sun is in the Ascendant with the moon in the XII Place, The Evil Daimon, the sun will have the control.
 If the sun is in the XI Place, The Good Daimon, and the moon is at MC, the sun will have the control.
 If the sun is in the Descendant while the moon is in the VIII Place following the sun, the sun will have the control.
 If the sun is in the XI Place following MC while the moon is in the Ascendant, the moon will have the control.
 Likewise if the sun is in the XI Place following MC while the moon is in the XII Place preceeding the Ascendant, the moon will have the control. (132.19–133.5)

And so on at great length. Pages are devoted to quasi-exhaustive listings of configurations. Firmicus Maternus, whose work is compiled entirely from earlier astrologers, does the same. At the end of a long chapter containing a (random?) list of possible configurations he has:

If the Ascendant is in one of the tropic signs, the moon in the XII Place, Jupiter and Mars in conjunction at IC, and Mercury and Venus in conjunction at MC, this is the chart of a malicious prostitute (VI 31.90).

In a passage like this it is tempting to believe that the author is citing a real horoscope to illustrate a particularly interesting configuration and that the forecast has been generalized from the career of a particular individual.³³

In contrast, Ptolemy prefers the axiomatic method. He begins his discussion of each type of forecast as he began his discussion of astrology in general: first he lays down the principles that are universally true, then he applies them in individual cases. Chapter 4.4, “On the Quality of Action,” (Robbins 380—he means “Occupations”) will serve as an example. In this chapter Ptolemy first specifies which points of the ecliptic control occupations: the sun and MC plus the star or stars closest to those points. He then describes the effects of the stars taken *individually*: Mercury makes men scribes and businessmen, men who deal in words; Venus makes men dealers in unguents, wine, and similar items; Mars makes men who use fire in their crafts. Then he specifies the effects of *additional stars in aspect* with the governing star: if Saturn is in aspect with Mercury, men become stewards and prophets; if Jupiter is in aspect, men become lawmakers and orators. Next Ptolemy discusses the forecast when *two* stars equally rule the occupation: Mercury and Mars ruling together produce sculptors, armorers, wrestlers, forgers. Then come the effects of *additional stars in aspect with the two*: Saturn in aspect with Mercury and Mars produces sneak-thieves, pirates,

³³ F. Cumont made this suggestion, proposing that a forecast in Firmicius 8.20.9 was generalized from the career of the royal eunuch Eulaios (executed 170 BC). Only rarely is there a chance of attaching a name to a forecast. See F. Cumont, *L’Egypt des Astrologues* (Brussels 1937) 207–13.

villains. In short, everything is described under headings and in strict order and organization.

A particularly revealing example of the difference between Ptolemy's style of forecasting and that of the other astrologers can be found in one passage of Hephaistion, who copied the *Tetrabiblos*, borrowing Ptolemy's system of organization for the first two books, but with significant additions and omissions.³⁴ In *Tetrabiblos* 3.5, "On Parents," Ptolemy had laid down a general principle for forecasting: the forecaster "must both here and in all cases remember the mixture of astral influence, and if the ruler of the places in question are not of one kind, but are different or productive of contrary effects, he should discover which ones (in any given case) have the greatest number of claims to control the outcome. We must do this so that we may make the inquiry according to the nature of the stars individually, or (if the claims of several to be ruler are of equal weight since they are together) so that we may successfully calculate the effects of their combined natures" (3.5.11; Robbins 248–50). In other words, the astrologer must use his own judgement and experience in evaluating possible combinations. Hephaistion, while copying verbatim the rest of this chapter, omits this entire sentence. (It should follow 2.4.17). The practicing astrologer preferred cut and dried methods which left less to the imagination; he preferred ready reference to a Lot, a Place, a list of configurations, rather than a vague directive to use his own judgement.

PROFESSIONAL MALICE

Not only in astrological methods and organization can we see differences between Ptolemy and some other astrologers, but also in their attitudes towards their colleagues: Ptolemy, for whatever reason, shows few signs of the animosity toward fellow professionals which is so evident in ancient literary society. Literary polemics by one professional sophist against another are well known.³⁵ These men "denounced each other with wit and erudition" as befits their rhetorical attainments. Other professionals acted similarly in their struggle for success. The physician Galen insults his opponents: "I call upon all the gods to witness that I myself am ashamed of refuting their shameless arguments. I consider it better that people in general be not informed of these arguments, so that they may not be harmed by the spectacle of philosophers

³⁴ Book 3 of Hephaistion's *Apotelesmatica* has no parallel in Ptolemy, but seems to be borrowed almost entirely from Dorotheus and is our main source of the Greek fragments of Dorotheus.

³⁵ A handy discussion in G. W. Bowersock, *Greek Sophists in the Roman Empire* (Oxford 1969) 89–100. (The quote in the following sentence is from p. 89.) The original source is primarily Philostratus, *Vitae Sophistarum*. Also see D. A. Russell, *Greek Declamation* (Oxford 1983) for an entertaining picture of the somewhat paranoid fantasy world inhabited by the declaimer/sophist.

writing about things they have never seen as if they had seen them; for then the people too are less ashamed at being caught in a lie.”³⁶ Philosophers abused one another. Even the saintly, but sharp-tongued, Jerome called the neo-Platonic philosopher Porphyry “a scoundrel, a vilifier, a sycophant, a lunatic, a mad dog.” Augustine called his former Manichaean spiritual advisor, Faustus, “a decoy of the devil,” “uninformed,” “ignorant,” “a deadly snare for many.”³⁷

Mathematicians, geometers, and others in what we would call (anachronistically) the scientific specialties were almost certainly considered part of the literary world—or more precisely, as possible participants in literary discussion. They occasionally appear as participants in the dialog, a popular genre in the later Empire. The diners in the best known dialog, Athenaeus’s *Deipnosophists*, include philosophers, grammarians, a doctor (Galen), a musician, and a lawyer (Ulpian; whether this is the famous lawyer is disputed). The list of participants shows that the literary culture did not exclude an interest in medicine and law.³⁸ In a similar manner, Plutarch’s dialog *De facie* (*Concerning the Face in the Moon*) portrays a wealthy Roman, Sextius Sulla, Plutarch’s brother Lamprias, a geometer Apollonides, a philosopher appropriately named Aristotle, the grammarian Theon, and the mathematician Menelaus, all discussing why the moon’s surface does not appear uniform, as standard Aristotelian theory would lead one to believe.³⁹ This cast of characters shows that when the subject is appropriate, mathematicians and geometers can participate in these literary exercises, and I would suggest that an astronomer (Hipparchus is in fact mentioned in *De facie* 921d) or an astrologer would likewise be admitted to the circle of sophistic participants.

Even if we cannot prove this assertion, we can see that the astrologers enthusiastically attacked their rivals very much as the sophists did. Vettius Valens says that the books of the “ancient” astrologers are incomprehensible and in fact dangerous to the mental health of their readers for one of two reasons: either 1) the writer did not understand astrological doctrine but decided to write anyway, despite his ignorance, or 2) he did understand the doctrines but wrote so obscurely because of his malice toward his students.

³⁶ Galen, *On the Doctrines of Hippocrates and Plato*, ed. and trans. Phillip De Lacy (Berlin 1981) 8.1.17, page 485.

³⁷ Jerome’s epithets collected in J. Bidez, *Cambridge Ancient History* 12 (1939) 634, Augustine’s from his *Confessions* 5.3 and 7, trans. Pine-Coffin. Further examples would be entertaining but otiose.

³⁸ The second century’s great, perhaps even perverse, interest in medicine brought fame to Galen; see Bowersock (above, note 35).

³⁹ Sextius Sulla was a friend of C. Minicius Fundanus, governor of Asia under Hadrian and the dedicatee of Plutarch’s *De cohibenda ira* (*De coh. ira* 453a); Menelaus is probably the Alexandrian mathematician cited by Ptolemy (*Almagest* 7.3; see Cherniss’s note in the Loeb edition, *Plutarch’s Moralia* XII. 7–8); Apollonides and Aristotle are unknown and perhaps fictitious.

"Despite God's generosity in supplying the lovely and magnificent elements of the world to men for their use [viz. the stars for forecasting], these astrologers revealed their discoveries only so far as they were willing or able." Valens wonders at the "crabbed obscurity of their thought." Not so with himself: "I reveal whatever I have discovered through my experience" (272.7–18).

The malice of rivals and the generosity of one's own teaching is a recurrent motif in certain astrological writings. Valens says of Nechepso and Critodemus: "They were carried away by the beauty of words and by their marvel-mongering. Their works did not match their promises nor were their treatises complete and lucid. These men fell short in many respects and [deceived] their readers because of their warped, grudging, withdrawn, and tangled character." Critodemus, despite his talents, "made his knowledge obscure" (328.23–329.8). But Valens "considers it right to continue in this book the explanation of the matters necessary to complete the previously discussed topics, not however in a *recherché* or obscure manner." He aims for "absolute clarity with perfect comprehension for those who are attentive" (331.8–12). The "Egyptians" took doctrines and methods which were "originally simple in accord with the universal harmony, and locked them up behind complex and interwoven distinctions made with over-elaborate words and methods." Valens then "broke through the gates of their fortifications and opened a way to those who wish to enter" (334.6–16). Another astrologer, Firmicus Maternus, mentions the *invidia* which seeks to deceive the student, the "vice of malicious silence," and the attacks of "malign adversaries" (*Mathesis* 5 Praefatio 2). In short, the writer pictures himself as a helper leading the student through the snares laid by his predecessors.

Along with their attacks on predecessors and rivals, the astrologers cast a cloak of quasi-religious reverence over their own teachings. Often they claimed divine inspiration: "After navigating many seas and traversing great deserts I was thought worthy by the gods of attaining a safe haven and a secure resting place" (Critodemus in Valens 329.20–22). Nechepso is in ecstasy: "I seemed to tread the aether, and a voice from Heaven echoed around me" (in Valens 241.16–17).⁴⁰ Ptolemy too gave voice, in terms similar to Nechepso's, to the ecstasy brought on by his astronomical work. His poem is perhaps worth quoting here as the best expression of such feelings:

Οἷδ' ὅτι θνητὸς ἔφυν καὶ ἐφάμερος, ἀλλ' ὅταν ἄστρον
μαστεύω πυκινὰς ἀμφιδρόμους ἑλίκας,

⁴⁰ To Nechepso, allegedly a pharaoh of the XXVI Dynasty, and to his priestly associate Petosiris, were attributed a handbook of astrology compiled in Egypt in the first or second century BC. This handbook, the source of all astrological wisdom, is quoted by Valens, Firmicius, and Hephaistion, and is mentioned by Ptolemy (3.11.1). Fragments in E. Riess, "Nechepsonis et Petosiridis Fragmenta Magica," *Philologus Supplementband* 6 (1892).

οὐκέτ' ἐπιψαύω ποσὶ γαίης, ἀλλὰ παρ' αὐτῷ
 Ζανὶ διοτρεφέος πίμπλαμαι ἀμβροσίης. (*AP* 9.577)⁴¹

The modern reader can be forgiven for believing that Ptolemy's achievements gave him more justification for his feelings of rapture than did the achievements of his lesser colleagues.

Such rapture may be produced by the divine source of the astrologer's knowledge. The story told by the physician Thessalus in the dedication of his book on astrological botany is well known: after long and unsuccessful researches, he was at last granted a personal interview with the god Asclepius, who addressed him as "Blessed Thessalus, who art already honored by God and who wilt in the future be revered by men as a god when thy success is known; ask what thou wilt; gladly will I grant thee all." The god then answers all his questions.⁴² Any teacher or researcher would be delighted with a testimonial from God Himself.

If the writer's knowledge is so valuable, it must, of course, be kept from the defiling ears of the vulgar crowd. To prevent its dissemination, Critodemus exacted "frightful oaths" from his students (Valens 150.16). Valens adjures his "son" (=disciple) Marcus "by the Sun, the Moon, and the orbits of the Five Planets, by Nature, by Providence, and by the Four Elements, not to impart his teachings to the ignorant or to a chance acquaintance" (293.26–29. Also 172.31–173.4; 238.24; 263 *passim*). Firmicus cites the oaths of silence exacted by Orpheus, Plato, Pythagoras, and Porphyry, oaths that their arcana (*religionēs*) would not be betrayed to profane ears (*Mathesis* 7.1.1).

The astrologers abused others and cast a religious aura on their own work, not to defend astrology or to prove its value—they are attacking their fellows, not unbelieving outsiders—but to gain a livelihood. They are attempting to elevate themselves in the eyes of their students and the public. Valens exhorts his students: "If anyone reads in another's treatise any of the teachings given here [i.e. in Valens' treatise], he should not give honor and praise to that other writer, but to me (Valens) as the forerunner, the discoverer, and the arranger of these doctrines" (173.16–20).

Now Ptolemy is not entirely immune to the pleasures of attacking his colleagues; he is however more restrained. When referring to his predecessor, the geographer Marinus,⁴³ Ptolemy says that Marinus "worked diligently" and "added to what was already known of the world, carefully reviewing and

⁴¹ Text from P. Waltz and G. Soury, *Anthologie grecque* (Paris 1974); see also F. Boll, *Studien über Claudius Ptolemäus* (1894) 74.

⁴² Thessalus' letter of dedication containing this story is edited by P. Boudreaux in *Catalogus Codicum Astrologorum Graecorum* VIII 3 (Brussels 1912) 132ff and by F. Cumont in *CCAG* VIII 4 (Brussels 1921) 253ff. For a discussion see A. D. Nock, *Conversion* (Oxford 1933) 108ff, from whom I borrowed this quite appropriate translation.

⁴³ For Marinus, see Hans von Mzik, *Des Klaudius Ptolemaios Einführung in der darstellenden Erdkunde* (Vienna 1938) 24–26, and the references there.

revising his predecessors' work." On the other hand, Marinus's work was "careless" and does not demonstrate an "understanding on which [his successors] could build" (*Geography* 1.6).

Note however that Ptolemy's criticism does not develop into vilification, nor does he claim divine inspiration for his own work and exact oaths of secrecy from his students. "We thought it fitting to guide our actions . . . 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" (*Almagest* 1.1, translation by G. Toomer). His comment does not of course directly refer to his relationships with colleagues, but it is indicative of the lofty, theoretical cast of mind so congenial to the great astronomer. He mentions the greatest of his predecessors, "that lover of truth" Hipparchus, most respectfully: one of Hipparchus' errors is excused as due to a faulty observation (*Almagest* 3.1). In neither the *Almagest* nor the *Tetrabiblos* does Ptolemy ever mention other contemporaries by name nor does he engage in acrimony. He notes with approval the comment of the "ancient astrologer"⁴⁴ who thought it ridiculous to predict events in the life of a person who will not survive until the time of the predicted events (*Tetrabiblos* 3.11.1; Robbins 270). Even when he expresses disagreement he is not ill-tempered. For example, he criticises the "Egyptian" system of allotting the "terms" of the stars. These are the portions of each sign which are allotted to each of the planets; for example, 6° of Aries are allotted to Jupiter, 6° to Venus, 8° to Mercury, 5° to Mars, 5° to Saturn. Each sign has a different arrangement of terms. Ptolemy finds no logic in their system: it does not follow the rulership of the houses, the triangles, or the exaltations, the number of degrees in each term is not consistent with the years of life granted by the term or with the sign's rising time (1.21; Robbins 90). Ptolemy then reports two superior systems, the Chaldaean and his own. In this lengthy discussion he never resorts to abuse of the "Egyptians" or to extravagant self-praise. Indeed he attributes his own system, not to his own genius, but to his discovery of a virtually illegible ancient manuscript. (This reference to a mysterious manuscript is his closest approach to a claim of special inspiration.) The contrast between Ptolemy's restraint and Valens' abuse of his colleagues combined with claims to divine aid could not be more striking, and it indicates the gap that separates Ptolemy from his colleagues.

Reviewing then the differences between Ptolemy on the one hand and Dorotheus, Valens, Haphaistion, and Firmicus on the other, one can clearly see the great astronomer's detachment from the professional concerns of the typical astrologer and his emphasis on the theoretical and universal aspects of astrology. He pays little, or no, attention to the procedures for answering everyday questions, for finding lost items, for diagnosing illness. His goal was

⁴⁴ Presumably Petosiris. See E. Riess, "Nechepsonis et Petosiridis Fragmenta Magica" 358.

to outline the theoretical basis for the sometimes obvious, sometimes obscure, power which the celestial bodies have over the earth and to point out the effects of such power. While the other compilers discussed here may have had some interest in astrological theory—indeed Hephaistion transcribed most of the *Tetrabiblos* into his own text—the bulk of their writings address the concerns of traditional astrology: purely descriptive astronomy (the constellations, the 12 signs, etc.—best seen in Manilius) and the necessary ready-reference methods and numerology (as in Dorotheus and Valens). 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.⁴⁵

⁴⁵ I have not investigated the point raised by Neugebauer and Van Hoesen (*GH* 176), that astrology was still in the process of development in the second century of our era, Ptolemy's lifetime. While this statement is undoubtedly true, as a glance into the much later *De revolutionibus nativitatum* of Albumasar will show, and since this fact could account for the differences between Ptolemy and the later astrologers, I have confined my comparisons in this paper to doctrines and methods which are universally used in Greco-Roman astrology, either by astrologers contemporary with (Valens) or prior to (Dorotheus, including citations in Hephaistion) Ptolemy, and which thus have a good chance of being old. The result still may be uncertain, since these texts were handbooks for working astrologers and were adapted to later methods by the addition of marginal notes and appendices. Such adaptation, for example, is clearly visible in the Arabic text of Dorotheus and the fifth-century addition to Valens (pp. 364–72).

Diagram #1

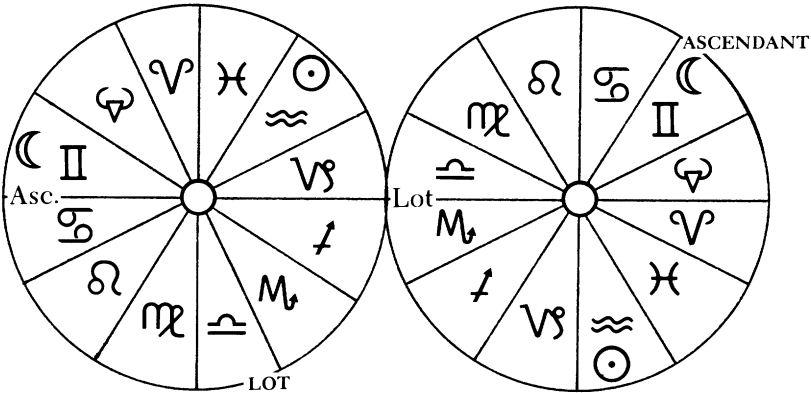


Diagram #2

