The Ptolemaic View of the Universe

Wolfgang Hübner

THE ANCIENT GEOCENTRIC SYSTEM commonly is termed "Ptolemaic," and the same is said even of ancient astrological lore,[1] although Ptolemy did not invent either the geocentric or the astrological system. His principal merit was to have focused the history of astronomy for nearly a thousand years from 800 B.C. down to his age, the late second century ·A.D., into a comprehensive account, and to have described all the complicated motions of the stars in an elegant abstract language. But he has been severely indicted in Robert R. Newton's *The Crime of Claudius Ptolemy.*[2] Newton tried to demonstrate the zero reliability for nearly all observations—those Ptolemy claims to have made himself and those that he attributes to other astronomers as well. Newton writes (354): "Instead of abandoning the theories, he deliberately fabricated observations from the theories so that he could claim that the observation prove the validity of his theories. In every scientific or scholarly setting known, this practice is called fraud, and it is a crime against science and scholarship." And he adds a comparison (365): "This reminds me of a political cartoon that I saw some years ago ... The cartoon showed a pedestrian who

[1] For example recently A. Geneva, *Astrology and the Seventeenth Century Mind: William Lilly and the Language of the Stars* (Manchester/New York 1995); see my review, *International Journal of the Classical Tradition* 6 (1999) 243–251. It becomes all the more clear that in antiquity there was no terminological distinction between astrology and astronomy: W. Hübner, *Die Begriffe "Astrologie" und "Astronomie" in der Antike. Wortgeschichte und Wissenschaftssystematik, mit einer Hypothese zum Terminus "Quadrivium"* (*Abh Mainz* 1989.7).

[2] Robert R. Newton, *The Crime of Claudius Ptolemy* (Baltimore/London 1977).

had been knocked down by a passing car and who was now lying beside the road. The car had stopped a short distance beyond, and the driver was running back toward the victim while calling out: 'I'm a doctor. You're lucky I happened to be passing by!'" He explains: "Ptolemy is the doctor-driver and the victim is the science of astronomy," adding "we do not owe Ptolemy our thanks for the small amount of earlier astronomy that he has preserved. Instead, we owe him our condemnation for the large amount of genuine astronomy that he has caused us to lose."

The task of refuting this violent attack has been made easier by the Danish scholar Kristian Peder Moesgaard,[3] who invoked the monograph of his compatriot Olaf Pedersen,[4] *A Survey of the Almagest*, published three years before Newton's volume. Ptolemy indeed calculated and extrapolated more than he observed, and his astronomical data depend largely on the great Hipparchus. In his famous star-catalogue, for example, he always added 2°40′ to the ecliptical longitudes observed by Hipparchus. But he assumed a too slow precession of the equinoxes, one degree in 100 years instead of 71.6 years. So his catalogue given for the year 137 was only right for the year 63.

But this was not a deliberate fraud. Ptolemy spent all his efforts in synthesizing the results of earlier astronomy originating in the work of the Babylonians, earlier than himself by a millennium, and to bring them into an elegant abstract form, which was worthy to be transmitted to the Arabs in the eighth and ninth centuries and in western thought during the dark ages of science until the reawakening of science from the twelfth century onwards. The French scholar Germaine Aujac[5] rightly qualifies his works as "ouvrages de synthèse."

[3] K. P. Moesgaard, *Journal for the History of Astronomy* 11 (1980) 133–135.

[4] O. Pedersen, *A Survey of the Alamagest* (Odense 1974).

[5] Germaine Aujac, *Claude Ptolémée, astronome, astrologue, géographe. Connaissance et représentation du monde habité* (Paris 1993: hereafter AUJAC) 21.

I address here two matters: first the so-called Ptolemaic cosmology, which was not invented by Ptolemy, and second the specific Ptolemaic version of astrological geography.

1. Cosmology

Ptolemy was not only an astronomer and astrologer. He wrote many other works, on the theory of cognition, mechanics, harmonics, optics, and geography. This universalism is not only an individual trait; to the contrary, we can recognize two external principal influences. First there were the Pythagorean and Platonic traditions, so intimately connected that the Pythagorean nucleus and the Platonic additions can hardly be separated.[6] Nevertheless it is clear that the magnificent idea of the harmony of the spheres does go back to the Pythagoreans, first of all the analogy between the musical intervals and the distances of the planetary orbits. Ptolemy follows this in the Kanobos inscription, which now generally is considered genuine. At the end of his treatise on harmony, where he enlarges on the relationship between the musical intervals and the zodiacal aspects, he adds the analogy between the three main intervals (octave, fifth, fourth) and the Platonic threefold soul.[7] The Kanobus inscription, containing principally numbers pertinent to our solar system, was on a stone monument (στήλη) dedicated in the temple of Serapis at Kanobus. It seems to be something like the account of data concerning our human and solar system that was recently sent by missile into space in order to inform some extraterrestrial beings about our globe.

But there is not only a Platonic but also an Aristotelian heri-

[6] See W. Burkert, *Weisheit und Wissenschaft. Studien zu Pythagoras, Philolaos und Platon* (Nürnberg 1962), English translation with revisions by Edwin L. Minar: *Lore and Science in Ancient Pythagoreanism* (Cambridge [Mass.] 1972: hereafter BURKERT).

[7] Ptol. *Harm.* 3.5–16, cf. F. Boll, *Studien über Claudius Ptolemäus. Ein Beitrag zur Geschichte der griechischen Philosophie und Astrologie* (Jahrb.class.Philol. Suppl. 21 [Leipzig 1894]) 49–244, esp. 93–109 "Philosophisches in der Harmonik" and 163–168 "Harmonik und Astronomie in der Tetrabiblos."

tage, since Alexander the Great had been taught by Aristotle; and his successor in Egypt, Ptolemy Soter, had called to his court the Peripatetic Demetrios of Phaleron to found the Alexandrian Mouseion.[8] Among the Platonists it was the wilful Herakleides Pontikos who continued the doctrine of the universal spirit; among the Alexandrian scholars it was Eratosthenes, nicknamed "Pentathlos"—that is, one who exercised many disciplines.

The Ptolemaic system finalized three main generally accepted doctrines:

1. First, despite many discussions, the universe generally was imagined to be closed (limited), the exterior shell (or skin) constituting the inner part of a hollow globe. This belief allowed a certain confidence in a pre-established harmony and a sentiment of security amidst the loneliness of an otherwise unlimited space without any supports.

2. But this universe was also imagined to be eternal,[9] because all celestial bodies appeared as globes, and the globe in spherical geometry (as well as the circle in two-dimension planimetry) was held to be the ideal, hence eternal figure. All celestial motions must be circular orbits, and every apparent deviation had to be explained by additional circles grafted onto the circles (ἐπικύκλια). Eudoxos of Knidos established 26 such circles, and Aristotle went up to 55.

That the universe was limited in space, but eternal in time, was a contradiction that was never resolved, although some philosophers sought to distinguish between the eternal gods and

[8] On the mainly Peripatetic basis of Ptolemy's lore see Boll (*supra* n.7) 68–111.

[9] See A. Ehrhardt, "*Creatio ex nihilo,*" *Studia Theologica* 4 (Lund 1950) 13–43, esp. 22–26. But the position held by Plato has been much discussed: J. Mansfeld, *The Pseudo-Hippocratic Tract Περὶ ἑβδομάδων ch. 1–11 and Greek Philosophy* (Assen 1971) 128–129. M. Baltes, "Γέγονεν (Platon, Tim. 28 B 7). Ist die Welt real entstanden oder nicht?" in *Polyhistor. Studies in the History and Historiography of Ancient Philosophy presented to Jaap Mansfeld,* edd. K. A. Algra, P. W. van der Horst, D. T. Runia (Leiden 1996) 76–96, with rich bibliography in n.2.

a universe that was extended in time but had neither beginning nor end.

3. The third axiom was the central position of the earth despite some attempts to move the earth from this sure and fixed position.

(a) First, the Pythagorean Philolaos postulated in the middle of the universe an unseen fire (which was not the sun), around which the seven planets plus the earth and an unseen "anti-earth" (ἀντίχθων) revolve. In this way he arrived at the holy Ten (δεκάς) of the Pythagoreans. But Plato and his students felt uneasy with this idea, and they stopped the alleged motion of the earth.

(b) It is not clear whether Herakleides Pontikos, in his lively dialogues, discussed the revolution of the earth around the sun, but he surely discussed its daily rotation.

(c) The first actual heliocentrist was Aristarchos of Samos, who put the sun in the very center of our planetary system (in which he was right, though his view that the sun was the center of the universe was wrong). Aristarchus had some followers like Seleukos of Babylon, but neither Hipparchos nor Ptolemy accepted his theory. The main reason that seemed to refute it was that one could not observe any parallax of the fixed stars: *i.e.,* if the earth circled around the sun, the stars would have to appear during the movement of the earth every day under a different angle; but one had to wait for the year 1838, when Friedrich Wilhelm Bessel finally observed the parallax of a fixed star. The ancient astronomers were able to determine rather precisely the distance of the moon from the earth; but the distances of the sun, the planets, and even the fixed stars were so inconceivably huge that all attempts to determine them failed. The authority of Hipparchos condemned the heliocentric theory to remaining only a transitory, discarded idea.

But in another sense antiquity was fairly aware of the vanishingly tiny extent of the earth in relation to the immense cosmic

distances. It was not only the middle (τὸ κέντρον, the center), but also a σημεῖον (the cross-point of two straight lines without any extension), in Latin *punctus* or *punctum*.[10] Considering this infinitely small size, the moralizing Stoics warned man to recognize the vanity of all human glory (and all imperialistic expansion, too) and appealed for modesty in all human affairs. 4. More eagerly than in the other philosophical schools, the Platonists had discussed the order of the seven planets (the luminaries sun and moon included), and here we encounter many different proposals.[11] It was fairly easy to describe the motion of the moon, the only true "planet" in the ancient sense (that is: turning around the earth); it was also less difficult to describe the orbits of the three exterior planets (Saturn, Jupiter, and Mars) with their rather slow and rather regular motions— apart from their turning back when they are seen in opposition to the sun; but it was extremely difficult to understand the rapid motions of Mercury and Venus, which are always near the sun, so that for these two companions of the sun also helio- satellitic systems were proposed. Ptolemy adopts a system attested since Archimedes in the third century B.C.,[12] which

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[10]See M. Federspiel, "Sur un emploi de sèmeion dans les mathématiques grecques," in *Sciences exactes et sciences appliquées à Alexandrie*, ed. G. Argoud et J.-Y. Guillaumin (Saint-Étienne 1998) 55–72. In astronomy: σημεῖον: Geminos 16.29 ἡ γὰρ γῆ μέση κεῖται τοῦ σύμπαντος κόσμου σημείου τάξιν ἐπέχουσα, Kleomed. 1.8.57 ἡ κέντρου λόγον ἐπέχουσα πρὸς τὴν ἡλιακὴν σφαῖραν, *et al.* Both expressions combined, Ptol. Synt. 1.2 p.9.22 κέντρῳ παραπλησίως ... σημείου λόγον ἔχει πρὸς τὴν τῶν ἀπλανῶν ἀστέρων σφαῖραν, 1.6 p. 21.2 διὰ τοῦ κατὰ τὸ κέντρον τῆς γῆς σημείου. *Punctum:* Cic. *Rep.* 6.16 *quasi punctum eius,* Sen. *Q.Nat.* 1 *praef.* 8 and 11, Plin. *HN* 2.174 *mundi puncto ... haec est materia gloriae nostrae.* Macrobius translates σημεῖον by *signum*, *Somn.* 2.9.9 *quasi centron puncti obtinet locum ... cum ad caelum terra signum sit, quod dividi non possit in partes. Cf.* A. Traina, "L'aiuola che ci fa tanto feroci" [Dante *Parad.* 22.151]. Per la storia di un topos," in *Forma futuri. Studi in onore del Cardinale M. Pellegrino* (Torino 1975) 232–250, reprinted in *Poeti latini (e neolatini). Note e saggi filologici* I (Bologna 1975) 305–335, esp. 321–322.

[11]Burkert 278–300; W. and H. Gundel, "Planeten," *RE* 20 (1950) 2017–2185; J. Tester, *A History of Western Astrology* (Woodbridge 1987) 166–167 (list).

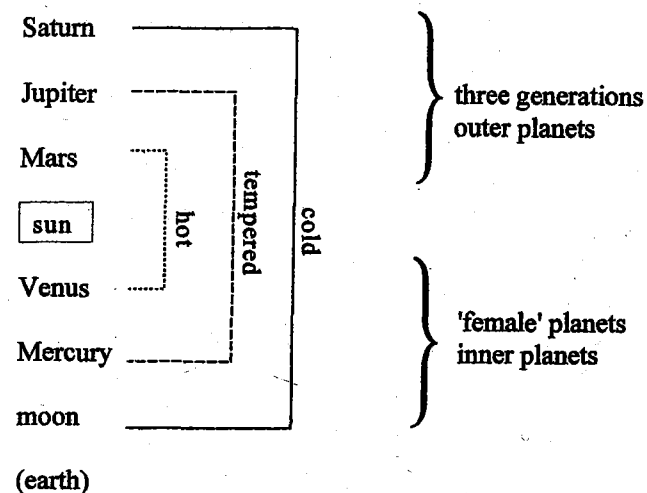[12]Macr. *Somn.* 1.19.1–2, 2.3.13. Burkert 297 and n.121.

Figure 1: The canonical planetary system

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prevailed as the standard system of all astrological handbooks and was never questioned by astrologers (see *fig.* 1).

This system owes its widespread success to its marvelous symmetry, which satisfies a human need for geometrical order. I would like to elucidate this by five points:

(a) First there is the medial position of the sun amidst the seven spheres.[13] Although in this system all the eight spheres (the spheres of the seven planets and the sphere of the fixed stars) rotate around the earth and hence the sun moves too, it could be called "heliocentric" in the sense that the celestial body that grants all our life is placed in the middle of the scale. Cor-

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[13]One of the earliest more detailed examples is Philo *Quis rer. divin. heres* 45 (III 50 Wendland): μέσος τῶν ἑπτὰ (*sc.* πλανήτων) Ἥλιος· μέσον δ' αὐτὸν οὐ μόνον ἐπεὶ μέσην ἐπέχει χώραν, ὡς ἠξίωσάν τινες, καλῶ, ἀλλ' ὅτι καὶ θεραπεύεσθαι καὶ δορυφορεῖσθαι πρὸς ὑπασπιζόντων ἑκατέρωθεν ἀξιώματος ἕνεκα καὶ μεγέθους καὶ ὠφελειῶν, ἃς τοῖς ἐπιγείοις ἅπασι παρέχει, δίκαιος ἄλλως ἐστί.

responding to the distance from earth, the Pythagorean harmonists also attributed to the sun the fifth musical interval, which they called μέση, "the middle."[14]

(b) On each side of the medial sun we find a triad of planets: The triad of the exterior planets[15] is constituted by three male deities of three generations: Κρόνος-Saturn (the old grandfather), Ζεύς-Jupiter (the middle-aged father), and Ἄρης-Mars (the young son). A prognostic correspondence to the three generations is attested already in the early astrologer Sudines in the third century B.C.[16] When in 1781 the first new planet was discovered by the Hannoverian William Herschel, it was named for the moment for its discoverer, "Herschel"—who himself proposed the panegyric name of his sovereign, King George III, *Georgium sidus*. But afterwards Greek mythology prevailed, and the new planet was called "Uranus," a very elegant solution, not only because Uranos was the father of Kronos (so that the series of generations was expanded to four), but also because already in antiquity, beyond the sphere of Saturn one ascended to that of the heaven, οὐρανός, whose wife Gaia, since Copernicus, had advanced to being a planet.[17]

The triad of the inner planets (moon, Mercury, and Venus) form a less coherent group, but the need for symmetry assimilated their characters one to another. They move more quickly and, at least for an observer on earth, less regularly than the exterior planets. The moon, more fanciful, deviates up to the north and down to the south of the ecliptic, hence its "lunatic"

character that antiquity related to the female gender which it shares with Venus. So, by *esprit de géométrie*, Mercury too became at least an hermaphrodite, if not quite a mere female planet.[18]

(c) In *fig.* 1 the symmetry between the upper and the lower triads becomes even clearer: The two planets near the central sun are hot, hence they govern all things that have to do with heat: Mars with war and Venus with love. Even today their symbols mark the two genders. We know that already in early times Ares and Aphrodite were worshipped together by the Greeks,[19] and the Romans continued to do so, putting them on one *lectus* of the *lectisternium*, or venerating them in the same temple of *Mars Ultor*.[20]

On the other side, far from the heating sun, we find two cold and mostly moist planets, Saturn and the moon.

In the middle between the central hot and the marginal cold planets, two well-moderated planets circulate, the "jovial" Jupiter and Mercury, his youngest son (among those born from a goddess), who in more than one regard resembles his father. Their common moderate temperament tends to laughter,[21] and when they act together, it results in a *tragicomoedia* like the *Amphitruo* of Plautus.

(d) This perfect symmetry of focal energy diminishing from the center in two directions resembles the now better known symmetry of the five terrestrial zones, with the hot tropics in the middle, the northern und the southern temperate zones, and at the extemes the arctic and the antarctic regions. It may be that

[14]C. v. Jan, "Die Harmonie der Sphären," *Philologus* 52 (1894) 13–37, esp. 23; Burkert 297.

[15]Called by Ptol. *Apotel.* 3.8.3 Ἀνάκτορες: see W. Hübner, "Astrologie et mythologie dans la Tétrabible de Ptolémée d'Alexandrie," in *Sciences exactes* (*supra* n.10) 325–345.

[16]W. Hübner, "Zum Planetenfragment des Sudines (Pap. Gen. inv. 203)," *ZPE* 73 (1988) 33–42.

[17]W. Hübner, "Antike in der Astrologie der Gegenwart," in *Die Antike in der europäischen Gegenwart*, ed. W. Ludwig (Göttingen 1993) 103–124 and 179, esp. 111–112.

[18]A. Bouché-Leclercq, *L'Astrologie grecque* (Paris 1899) 103–104 (hereafter BOUCHÉ-LECLERCQ).

[19]W. Burkert, "Das Lied von Ares und Aphrodite. Zum Verhältnis von Odyssee und Ilias," *RhM* 103 (1960) 130–144, esp. 133 and n.6. *Cf.* O. Weinreich, "Zwölfgötter," Roscher, *Lex.* VI (1924–1937) 764–848 [= *Ausgewählte Schr.* II 555–664].

[20]E. Simon, *Die Götter der Römer* (Munich 1990) 140.

[21]One looks in vain for the laughter of these gods in D. Arnould, *Le rire et les larmes dans la littérature grecque d'Homère à Platon* (Paris 1990).
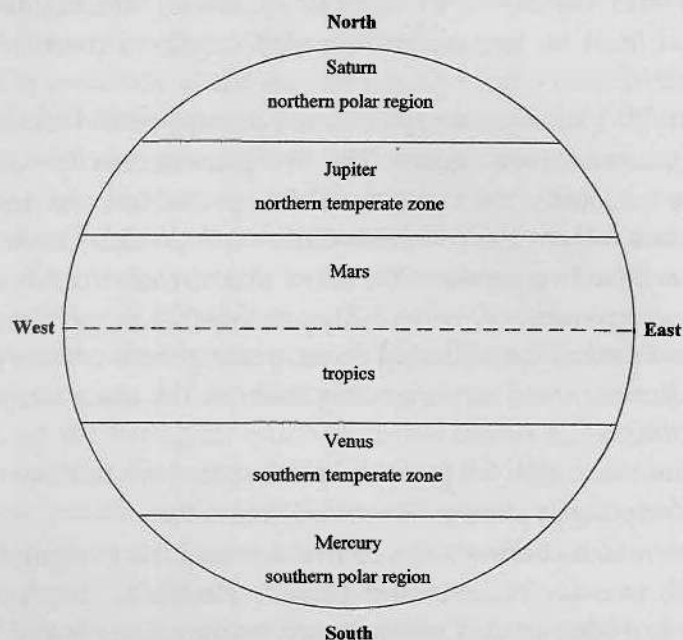
Figure 2: The five terrestrial zones paralleling the five true planets

Figure 3: Elements and planetary spheres
Laurent.Med.Pal. 89 fol. 7ᵛ

the heavenly symmetry was invented in imitation of the ter-
restrial one.[22] In late antiquity these five zones of the earth were
paralleled with the five true planets (apart from the two
luminaries), as shown in *fig.* 2 (Achilles *Isag.* 29 Maass).

The northern hemisphere is ruled by the traditional male triad
of the three generations: the polar region is given to the old and
cold Saturn, the temperate zone to the temperate Jupiter, and
the tropics to Mars who replaces the central sun (which itself

remains out of consideration here). In the southern hemisphere
in descending order it is Venus's turn, who gets the southern tem-
perate zone, so that in a regular parallelism the two beneficent
planets, Jupiter and Venus, govern the two temperate zones.
The antarctic region is given to Mercury, who is often en-
countered in a final position: he governs the last age of the
world (Firm. *Math.* 3.1.14), the little finger, and so on.[23] The
author of the geographical analogy, however, appeals to the fact
that the southern part of the earth was invisible for the ancients
just as Mercury is difficult to observe (Achill. *Isag.* 29 p.65.9
ἀφανής).

[22]There is only a weak hint on this in Philo (*supra* n.13), μέσον δ' αὐτὸν οὐ
μόνον ἐπεὶ μέσην ἐπέχει χώραν, ὡς ἠξίωσάν τινες, καλῶ. See W. Hübner,
"Geographischer und astrologischer Zonenberiff in der Antike," *Berichte zur
Wissenschaftsgeschichte* 24 (2001) 13–28.

[23]Anon. *CCAG* VII (1908) 239.5 and 244; *cf.* W. Hübner, "Manilius als
Astrologe und Dichter," *ANRW* II.32.1 (1984) 126–320, esp. 264 n.433.

	dry	moist
hot	fire	air
cold	earth	water

$$\pi\upsilon\rho\acute{o}\varsigma \qquad \acute{\alpha}\acute{\epsilon}\rho\sigma\varsigma$$
$$\ddot{\upsilon}\delta\alpha\tau\sigma\varsigma \qquad \gamma\tilde{\eta}\varsigma$$

Figure 4: Quadripartite system of the elements
(Ptolemy, *Ins.Can.* p.154.9–10)

(e) In some sources (in the Kanobus inscription and in Neo-Platonic authors[24]) we find the four elements interpolated between the earth and the moon (*fig.* 3). This order was facilitated by the homonymy of the term "earth," either celestial body or one of the four elements. The astrologers rejected Aristotle's *quinta essentia*, but accepted the widespread system of the four elements that can be arranged in a two-dimensional figure, either according to the opposition hot-cold or according to the opposition dry-moist (*fig.* 4). The various sources frequently disagree about which element held the final position: usually it was occupied by the earth,[25] because (as the homonymous celestial body) it constitutes the inner and the lowest part of the universe. In this way the two "flow" elements, air and water, mediate between the fire of the stars on one side and the

[24]Ptol. *Ins.Can.* p.154.9–10 Heiberg; *cf.* I. Düring, *Ptolemaios und Porphyrios über die Musik* (Göteborg 1934) 281–282. See also Salustios Περὶ θεῶν 6; Chalcid. *In Tim.* 178 p.207.6–9; Boeth. *Cons.* 4 m.1.

[25]Parmenides *ap.* Arist. *Gen.Corr.* 2.3 330b2; Pl. *Ti.* 32B, etc. It is only in the last of the many varying enumerations in *Timaeus* that the order appears according to alleged heaviness: fire-air-water-earth. This order became authoritative with Aristotle: *Cael.* 1.3 269b28 etc., *Meteor.* 1.2 339a15. For the varying order of the two lower elements, Burkert 62–63; R. Klibansky, E. Panofsky, F. Saxl, *Saturn and Melancholy* (London 1964) 64.
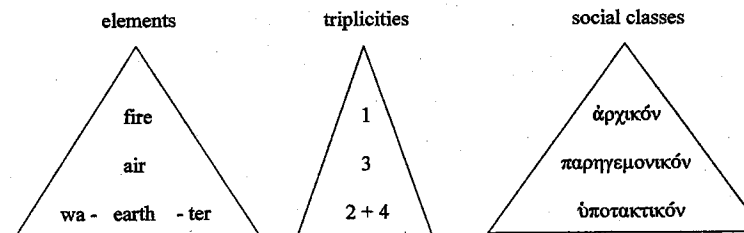
Figure 5: The hierarchy of the four elements

solid and ponderous earth on the other.[26] Rarely the final position was occupied by water, because one might penetrate deeper into the sea than into the earth, and because the sharpest contrast was seen between fire and water, and water in general was associated with perishableness. It was this hierarchy that the astrologers adopted without any further discussion.[27]

Between the two low and female elements, earth and water, one ascends through the mediating air up to fire, the element of the stars and the divine part of the human soul as well (*fig.* 5).

2. Astrology and Geography

Geography was not included in the seven liberal arts, but Varro (and after him Martianus Capella) treated it together with geometry. Martianus Capella calls geometry with a Pla-

[26]Astrology employed this system, so far as can be seen, only in relation to the four cardinal points, where the earth receives the lower culmination (*imum caelum*): Anon. *CCAG* I (1900) p.158.13–16.

[27]Arist. *Sens.* 5 443a10. In astrology: W. Hübner (*supra* n.23) 154–155 and n.103. For the hierarchy of the zodiacal triplicities see Hübner, *Die Eigenschaften der Tierkreiszeichen in der Antike. Ihre Darstellung und Verwendung unter besonderer Berücksichtigung des Manilius* (*Sudhoffs Archiv* Beih. 22 [Wiesbaden 1982]) 206–210 §4.21.
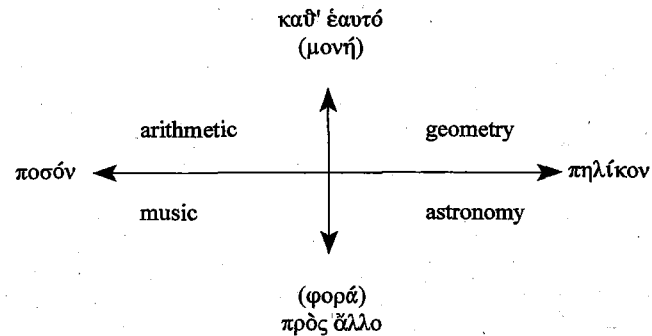
Figure 6: The four mathematical *artes liberales*
arranged by Nicomachus of Gerasa

tonic metaphor the "sister of astronomy,"[28] and if we consider
the speculative two-dimension system of Nicomachos of Ger-
asa[29] (*fig.* 6), which shows the same structure as that of the four
elements in *fig.* 4, we see that geometry and astronomy both
deal with quantities (μεγέθη), but differ in that geometry deals
with absolute quantities that do not move, and astronomy with
relative and moving quantities that are related to other things.
Hence not only astronomy and geometry, but also astronomy
and geography were closely linked in antiquity (and even in
modern times our geographical atlases usually contain maps of
the sky). In order to determine the geographical latitude and—
with more difficulty—longitude (the meridian), one had to use
sundials and horologia along with astronomical knowledge. So
Germaine Aujac is right when she states that "astronomie (voire
même astrologie) et géographie vont toujours de pair" (8).

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[28]Mart. Cap. 6.581, *germanae ipsius Astronomiae*. Ptolemy uses this Platonic
expression for the two highest senses, seeing and hearing (*Harm.* 3.3 p.94.1
Düring), καθάπερ ὡς ἀληθῶς ἀδελφαὶ γενομένω, and uses a further metaphor
for their offspring, arithmetic and geometry (p.94.18), ἀνεψιαὶ δ᾽ ὥσπερ καὶ
αὐταί, γενόμεναι μὲν ἐξ ἀδελφῶν ὄψεως καὶ ἀκοῆς, τεθραμμέναι δὲ ὡς ἐγγυ-
τάτω πρὸς γένους ὑπ᾽ ἀριθμητικῆς τε καὶ γεωμετρίας.

[29]*Arithm.* 1.3.1–2, quoting in what follows the Pythagoreans Androkydes
and Archytas; see Hübner (*supra* n.1) 52–55.

One must never forget that in antiquity the sky was much
better known than the earth. Farmers and navigators observed
the movements of the stars that served as a common calendar.
Except for the southern polar region, in clear weather the sky
was always visible from all countries, but the earth beyond the
Mediterranean area was unknown, and the reports of the ex-
plorers often were fantastic and could not be verified.

Today, to the contrary, almost all parts of the earth have been
discovered. We know much more about the universe than in
antiquity, and every day the television news shows us the
terrestrial globe from that astronautical perspective which the
Ciceronian Scipio could only see in a dream. Only a very small
number of persons even of higher education recognize the
motion of the fixed stars, or know the order of the planets—not
to mention the strange order of our planetary week which we
use every day.

Hence globes of the sky historically precede those of the earth,
and they were much more frequent in antiquity.[30] In the Renais-
sance the two globes got equal rights, so that every important
library proudly exhibited a pair of equally shaped globes: one of
the sky and one of the earth (*fig.* 7). But in our homes the
terrestrial globe prevails, and if there is a celestial one, this
is—rather than for the study of the stars—for superficial
decoration. To put it briefly: today our knowledge and our way
of life are more "geocentric" than in antiquity.

Ptolemy wrote first the *Syntaxis* and then the *Apotelesmatica*
(better known under the title *Tetrabiblos*), but his *Geographia* only
at the very end of his life, and it seems that this work remained
unfinished. It had a similar fate in modern times, for there is no
critical edition after that of Nobbe (Leipzig 1843–1845).[31] One

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[30]A. Schlachter, *Der Globus. Seine Entstehung und Verwendung in der An-
tike*, ed. F. Gisinger (Leipzig/Berlin 1927).

[31]It is only recently that Alfred Stückelberger (Bern), with international col-
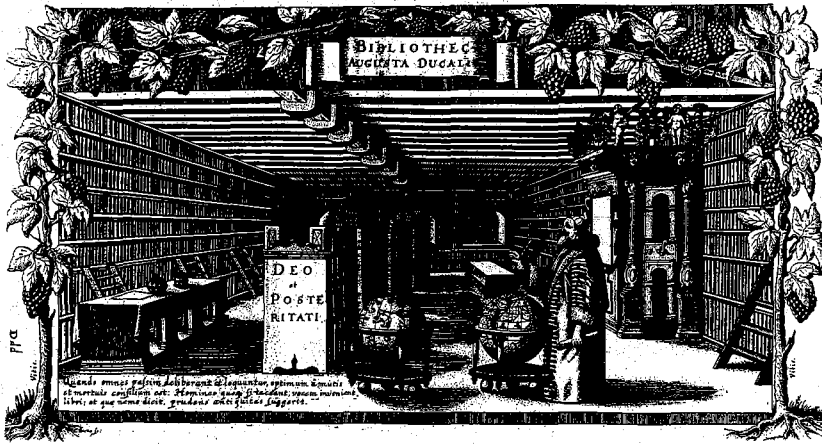laboration, has begun a new critical edition.

Figure 7: Celestial and terrestrial globes in the
Herzog August Bibliothek Wolfenbüttel (1650)

down to earth,[35] from macrocosm to microcosm, in their single works as well as in the sequence of their works,[36] and so did Ptolemy when he went from the stars down to earth.

Ptolemy's *Geographia* is a good example for our statement that in antiquity the earth was far less known than the heavens, for here he is (and must be) less exact and less reliable than in his famous description of the sky in the star-catalogue of his *Syntaxis*. From the earth's surface he embraces only about 80 latitudinal and 126 longitudinal degrees,[37] that is, in a north-south direction less than half and west-east about one third of the surface. Since he rejected the almost exact value of the circumference of the earth calculated by Eratosthenes in favor of that wrongly calculated by Poseidonios, his model of the earth became too small, so that he induced Christopher Colombus, who used an edition of Ptolemy's "Cosmographia" (this was the Renaissance title of the geographical work) to believe, when he arrived in America, that he had discovered India.[38]

He is more speculative in his astrological geography. The distribution of the twelve zodiacal signs to the countries of the οἰκουμένη, in early astrological works, was linked to two other locational structures: the *melothesia* (the distribution the twelve signs to the members of the human body) and the *deorum tutelae* (the distribution to the six male and six female deities of the

may compare the great French edition of Pliny the Elder, which began to appear just after the Second World War.[32] The most recent volumes have been very slow to appear; Books 3–6 concern geography.[33] The enormous mass of numbers and exotic names causes many editorial difficulties. In his *Geographia* Ptolemy enumerates not less than about 8,100 names of localities, which he entered in 26 maps: 10 maps for Europe, 4 for (northern) Africa, and 12 for Asia.[34]

But apart from these difficulties, there is to be observed a tradition in prose works and even more in didactic poetry: from Eratosthenes and Aratus' *Phaenomena* to Bonincontrius and Pontano in the Renaissance and Alexander von Humboldt in his *Kosmos*, authors follow a descending movement from heaven

[32] The first two volumes, containing Books 1 and 2, appeared in 1950.

[33] In 1980 Book 5 part 1 and Book 6 part 2, in 1998 Book 3.

[34] A. Stückelberger, "Klaudios Ptolemaios," in *Geographie und verwandte Wissenschaften*, ed. W. Hübner (Stuttgart 2000) 185–208.

[35] See W. Hübner, "Der *descensus* als ordnendes Prinzip der *Naturalis historia* des Plinius," in *Der Wandel der Enzyklopädie vom Hochmittelalter zur frühen Neuzeit* (Münstersche Mittelalter-Schriften, in press).

[36] For Aratus see W. Ludwig, "Die Phainomena Arats als hellenistische Dichtung," *Hermes* 91 (1963) 425–448, esp. 438 and 448; for Manilius, W. Hübner (*supra* n.23) 242–268. Pontano's sequence was: *Urania-Meteora-De Hortis Hesperidum*, and in the first book of his second poem he descends from God and the heavenly Trinity down to earth: see Laurentius Bonincontrius Miniatensis, *De rebus naturalibus et divinis. Zwei Lehrgedichte an Lorenzo de' Medici und Ferdinand von Aragonien*, ed. Stephan Heilen (Stuttgart/Leipzig 1999).

[37] Stückelberger (*supra* n.34) 203–204; J. L. Berggren and A. Jones, *Ptolemy's Geography: an Annotated Translation of the Theoretical Chapters* (Princeton/Oxford 2000) 21.

[38] Stückelberger (*supra* n.34) 207–208.

Roman *lectisternium*).[39] The numerous systems vary according either to the date of their origin or to the political horizon of the inventor's native country.[40]

In general, the astrological systems combine single planets or single zodiacal signs with certain countries (or groups of countries), but Ptolemy here differs from all these systems, as he differs in many regards from the astrological handbooks of Antiochos, Vettius Valens, Firmicus Maternus (the only one preserved in Latin), Hephaestion, Paulus Alexandrinus, down to Rhetorios in the seventh century. One misses fundamental chapters on the qualities of the zodiacal signs and the four triangular elements, on the *melothesia*, the Egyptian decans, the *paranatellonta*, on the draconitic nodes of the moon's orbit (treated theoretically in the *Syntaxis*, 6.6). So Germaine Aujac is right when she remarks: "Le non-dit ne manque pas non plus d'intérêt dans l'œuvre de Ptolémée" (22). Nor does Ptolemy articulate the habitable world according to the three traditional continents attested since Herodotus (Europe/Asia/Libye= northern Africa), although he follows this *orbis tripartitus* in his *Geographia* (2–8). An application of the three continents to the zodiac would have produced a system like that of the three squares determining the nature of the four seasons (*fig.* 8).[41]

The middle of the entirely developed seasons is constituted by the four "solid" signs: Taurus for spring/Leo for summer/Scorpio for fall/Aquarius for winter. This square called "solid" or "fixed" is preceded by the "tropical" ("turning") square that marks the beginning of the seasons: Aries for spring/Cancer for summer/Libra for fall/Capricorn for winter, and is followed by

[39] Hübner (*supra* n.23) 237–242. There is also a rare geographical *melothesia* in Ps.-Hippocr. *Hebd.* 11.

[40] A rich but not complete collection of sources is in A. E. Housman on Manil. 4.744–817 (1920), praef. XII–XVII; *cf.* J.-H. Abry, "Terra e cielo nella geografia zodiacale (Manil. 4.585–817)," *Sileno* 23 (1997) 32–47; G. de Callataÿ, "La géographie zodiacale de Manilius et l'*Énéide* de Virgile (*Astr.* 4,744–817)," *Latomus* 60 (2001) 35–66.
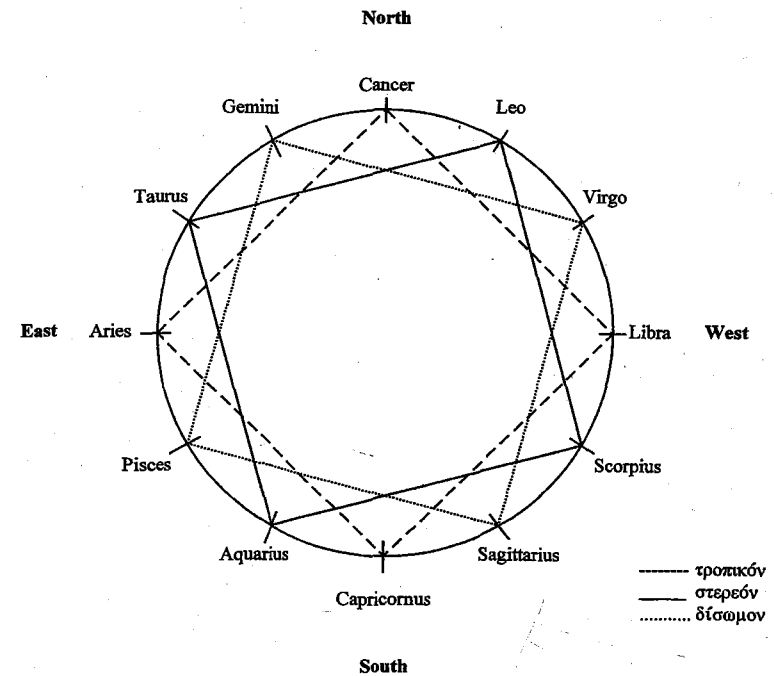
[41] Hübner (*supra* n.27) 74–80 §1.311.

Figure 8: The three squares corresponding to the three stages of the four seasons

the "double" signs that mark the end of the seasons and the transition to the next: Gemini from spring to summer/Virgo from summer to fall/Sagittarius from fall to winter/Pisces from winter to spring again. In this way eight ambiguous signs prevail over four signs of certain classification.

But instead of such a threefold system, Ptolemy prefers a quadripartition of the zodiac. In this case he had two possibilities:[42] either a system of four coherent quarters (or quadrants)

[42] On the manifold systems see Hübner (*supra* n.27) 261–274 §7.17, and 441–452.
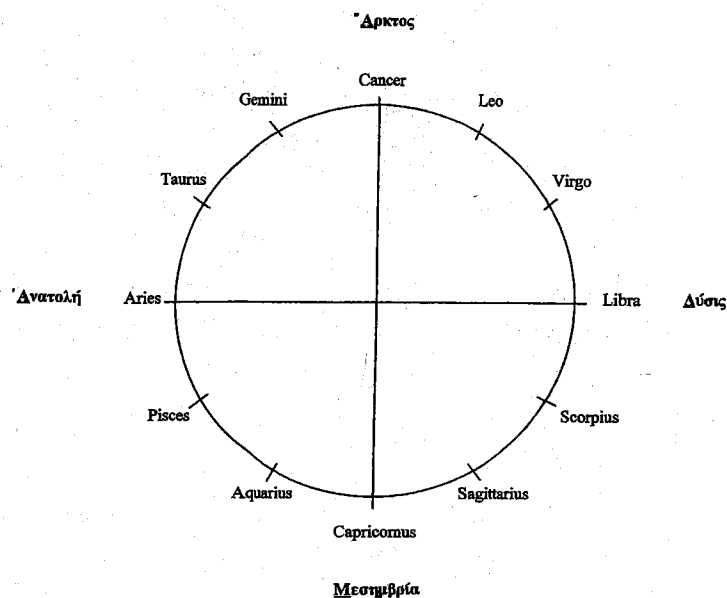
Figure 9: The four quarters of the zodiac distributed to the
four edges of the world (ADAM)

Figure 10: The four edges of the world and the four elements
corresponding to the four triangles of the zodiac

or a triangular system with four so-called triplicities of alternating signs. Although the four quarters correspond to the four seasons of our solar year, in astrology they were rarely related to the four edges of the world (*fig.* 9).[43] The main directions are generally enumerated cross-wise, so that the first letters of their Greek names, spelled in the order east-west and north-south, Ἀνατολή-Δύσις-Ἄρκτος-Μεσημβρία, form the acronym ΑΔΑΜ.[44] But Ptolemy, like most other astrologers, disdains this simple analogy in favor of a more complicated triangular

system. In this arrangement the peoples of the same group are not crowded together in the four quarters, but spread all over the zodiac, according to the alternating order of the four triplicities.

We know ten or (eliminating simple errors) a least nine such systems that distribute the four edges of the world to the four tropical signs, that is the cardinal signs of the four triangles. The earliest of these systems goes back to Geminos,[45] the most widespread is attested from Antiochos on,[46] who probably was

[43] Hübner (*supra* n.27) 264–265 §7.171.2, *cf.* 82–87 §1.32.

[44] F. Dornseiff, *Das Alphabet in Mystik und Magie*² (Leipzig/Berlin 1925); Hübner (*supra* n.27) 268–270 §7.172.14.
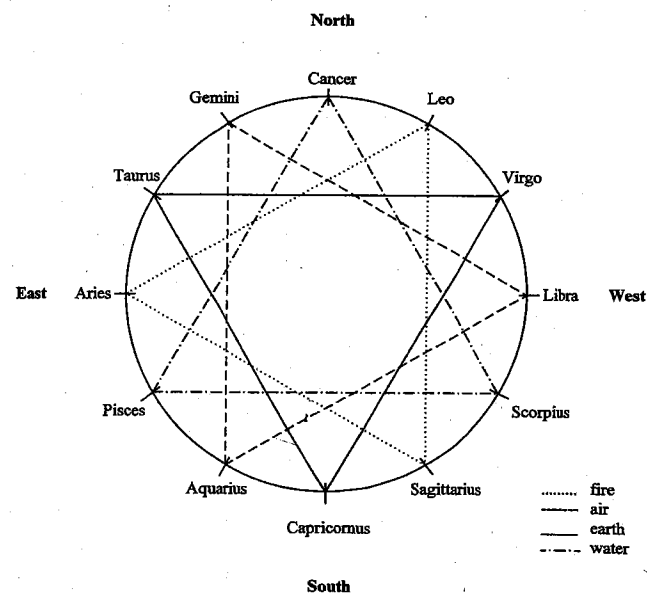
[45] Geminos 2.8–11: see Hübner (*supra* n.27) 261 §7.171.11.

[46] Antiochos *CCAG* VIII 3 (1912) p.112.23–26: see Hübner (*supra* n.27) 261–262 §7.171.13.

Ptolemy's contemporary. Moreover, it combines the four elements (*fig.* 10). This system starts from the vertical difference of the two tropical signs (in the true sense) that confine the zodiac: Cancer in the north and Capricorn in the south. These two tropical signs rule the two female triplicities of water and of earth. While this distribution is clear, the horizontal difference east-west changes every time, for across the eastern and western horizon pass all rising and setting stars. In this system, of the two remaining male triplicities the fiery triplicity of Aries is assigned to the rising east and the opposite airy triplicity of Libra to the setting west.

The German scholar Franz Boll, the rediscoverer of Ptolemy and the explorer of ancient astrology in general, supposed that Ptolemy wanted to relate these zodiacal triangles to geographical ones;[47] but this opinion has been rightly rejected by Richard Uhden.[48] Ptolemy accorded the greatest importance not to the zodiacal signs but to the planets that rule these signs or their triplicities. He developed this in two different chapters, more generally in Book 1, in more detail in Book 2, where he considers 72 countries, that is, not less than six countries for each sign on the average.

(a) Chapter 1.19

Astrologers who tried to distribute the seven planets on the circle of the twelve zodiacal signs were troubled by the fact that the numbers 7 and 12 (or 4) are incompatible. One solution was found in the system of the twelve so-called "planetary houses" (*fig.* 11).[49] After subtracting the two luminaries (sun and moon) and giving the sun to the Lion and the moon to the Crab (*fig.* 11 bottom), there remained ten signs that easily could be

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[47]Boll (*supra* n.9) 194–204.

[48]"Das Erdbild in der Tetrabiblos des Ptolemaios," *Philologus* 88 (1933) 302–325, esp. 304–305.
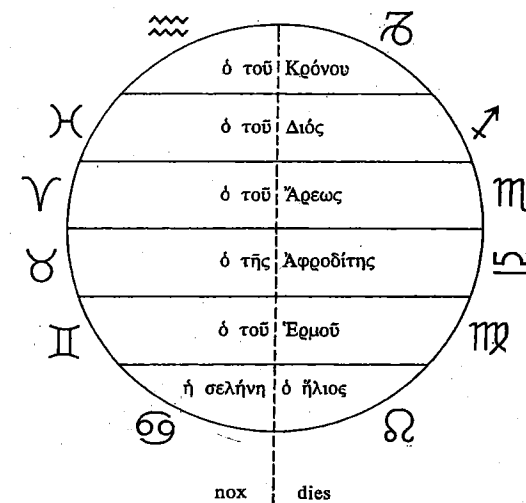
[49]Bouché-Leclercq 188–189.

Figure 11: The planetary houses of the twelve zodiacal signs

distributed to the five remaining true planets in such a way that—in the usual descending order from Saturn to Mercury—every planet gets two houses: on the right side, starting from the sun's Lion, the day house, and on the left, starting from the moon's Crab, the night house.

We need this system of the planetary houses to understand Ptolemy's rulers of the four triplicities, which also have a ruler by day and a ruler by night (*figs.* 11 and 12).[50]

1. The first triplicity (consisting of Aries-Leo-Sagittarius) is governed by day by the sun, the Lion's ruler, and at night by Jupiter, the daytime ruler of Sagittarius.

2. The second triplicity (Taurus-Virgo-Capricorn) is governed by day by Venus, the Bull's nighttime ruler, and at night by the

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[50]Bouché-Leclercq 199–206.

triplicity	zodiacal signs — houses			ruler by day	ruler by night	main direction	secondary direction	mixed
Δ1	Aries Mars	Leo sun	Sagittarius Jupiter	sun	Jupiter	north Jupiter	west Mars	NW
Δ2	Taurus Venus	Virgo Mercury	Capricornus Saturn	Venus	moon	south Venus	east Saturn	SE
Δ3	Gemini Mercury	Libra Venus	Aquarius Saturn	Saturn	Mercury	east Saturn	north Jupiter	NE
Δ4	Cancer moon	Scorpio Mars	Pisces Venus	Mars Venus	Mars moon	west Mars moon	south Venus	SW

Figure 12: Houses, rulers, and directions of the four triplicities

Jupiter
septentrio

Aries
Leo
Sagittarius

Gemini
Libra
Aquarius

occidens
Mars

βορρολιβυκόν
νοτολιβυκόν

Mercurius

βορραπηλιωτικόν
νόταπηλιωτικόν

oriens
Saturnus

Cancer
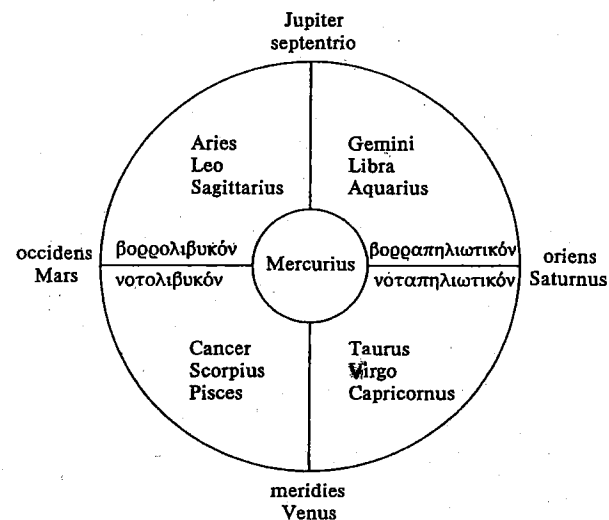Scorpius
Pisces

Taurus
Virgo
Capricornus

meridies
Venus

Figure 13: The planetary rulers of the four triplicities
(Ptol. Apotel. 1.19)

moon which has no relation to any of the three signs, but together with Venus is the other nocturnal planet according to the classification into diurnal and nocturnal planets (fig. 14).[51]

3. The third triplicity (Gemini-Libra-Aquarius) is governed by day by Saturn, the nighttime ruler of Aquarius, and at night by Mercury, the Twins' nighttime ruler.

4. The fourth triplicity (Cancer-Scorpio-Pisces) is ruled by Mars by day and by night as well. This reveals the difficulty arising from the fact that twice four rulers are needed, but there are only seven planets to use, so that for the last triplicity one planet is lacking. Ptolemy backs out of the business by joining to Mars his old companion Venus (and moreover the moon), the other nocturnal planets according to fig. 14, so that the co-ruler of the triplicity is Venus by day and the moon by night.

[51] Ptol. Apotel. 1.7 and Bouché-Leclercq 103–104.

	luminary	beneficent plant	maleficent planet
day	sun	Jupiter	Saturn
ambiguous		Mercury	
night	moon	Venus	Mars

Figure 14: Daytime planets and nighttime planets
(Ptol. *Apotel.* 1.7)

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In a second step Ptolemy distributes the triangular rulers to the edges of the world. As each of the four triplicities has two planetary rulers, the directions are also divided in two: a main direction ruled by a main ruler (οἰκοδεσπότης) and a secondary direction ruled by a co-ruler (συνοικοδεσπότης), so that the four combinations of two directions form four quarters of the circle: north-west/south-east/north-east/south-west. In this way Ptolemy combines the triangular system with the quaternary system (*figs.* 13 and 15).

1. The first triplicity owes its mainly northern direction to Jupiter, the daytime ruler of Sagittarius, and its secondary western direction to Mars, the nighttime ruler of Aries. These two directions form together the north-western quarter.

2. The opposite second triplicity owes its mainly southern direction to Venus, the nighttime ruler of the Bull, and its secondary eastern direction to Saturn, the daytime ruler of Capricorn. These two directions form together the south-eastern quarter.

3. The third triplicity owes its mainly eastern direction to Saturn, the nighttime ruler of Aquarius, but its secondary northern direction to none of its zodiacal signs. Ptolemy associates Jupiter, the other diurnal planet according to *fig.* 14, with Saturn. These two directions form together the north-eastern quarter.
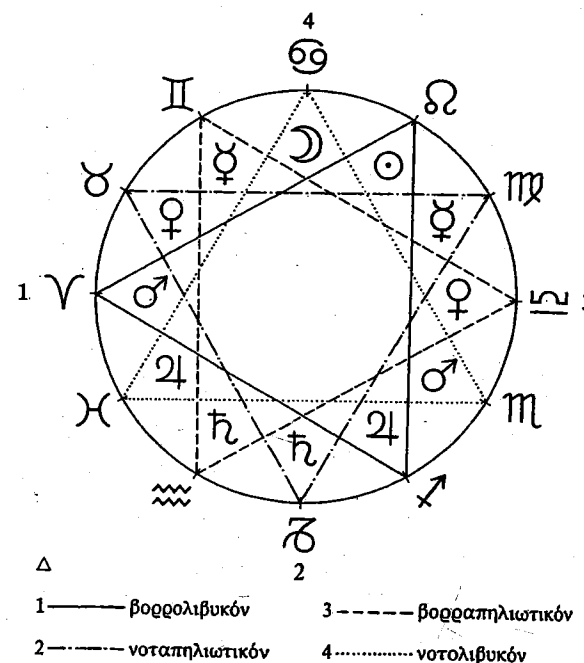
1——— βορρολιβυκόν   3 – – – – – βορραπηλιωτικόν
2—·——·— νοταπηλιωτικόν   4············· νοτολιβυκόν

Figure 15: Directions of planets and triplicities
(Ptol. *Apotel.* 1.19 and 2.3)

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4. The opposite fourth triplicity owes its mainly western direction to Mars, the daytime ruler of Scorpio, and its secondary southern direction to Venus, which rules the Fishes, having in this sign also its exaltation (ὕψωμα), which astrologers explained by the extreme fertility of fish.[52] These two directions form together the south-western quarter.

In *fig.* 13 we can see that the vertical (north-southern) axis is occupied by the two benevolent planets (Jupiter and Venus),

[52] Bouché-Leclercq 195. For the prolific nature of Pisces see Hübner (*supra* n.27) 156–164 §3.321 and 499–502.

and the horizontal (west-eastern) axis by the two malevolent planets (Saturn and Mars). Mercury remains ambiguous as in *fig.* 14. Moreover, the two northern (and upper) quarters are governed by the two higher and more efficacious planets (Jupiter and Saturn), and the two southern (and lower) quarters by the two minor and weaker planets (Venus and Mars). In this manner—as elsewhere in astrology—the north prevails over the south.[53]

(b) Chapter 2.3

Chapter 2.3 is the longest of the *Apotelesmatika* and fills out the basic and preliminary chapter of Book 1 with geographical details. It is divided into two parts. At the beginnng (2.3.3–8) Ptolemy repeats the four quarters from the first book, and then he treats at full length all the 72 peoples (or countries), that is, six countries for each sign on average. In the following chapter he will sum this up in a short diagram (2.4).

In the more general beginning each quarter gets two names (*fig.* 16). The continents' names are accompanied by a main people's country. In order to bring the three continents into a quadrifold system, Ptolemy divides the largest, Asia, into two parts, which occupy together the two eastern quarters (north-east and south-east). And as Asia is divided into a βόρειον μέρος and a νότιον μέρος, also the two southern quarters are linked by the two opposing Ethiopias—known since Homer and mentioned by Ptolemy also in his *Geographia* (7.3.1), ἑσπερία Αἰθιοπία and ἑῴα Αἰθιοπία. Only Europe remains without any link in the northwestern corner, and specified by Gaul (Κελτογαλατία), opposite to Σκυθία on the eastern side.

[53] For example in the system of the commanding and obeying signs: Bouché-Leclercq 163. Hübner (*supra* n.27) 67–71 §1.221.4. See also Varro *Rust.* 1.2.3, *et sine dubio quoniam salubrior pars septemtrionalis est quam meridiana, et, quae salubriora, illa fructuosiora.*
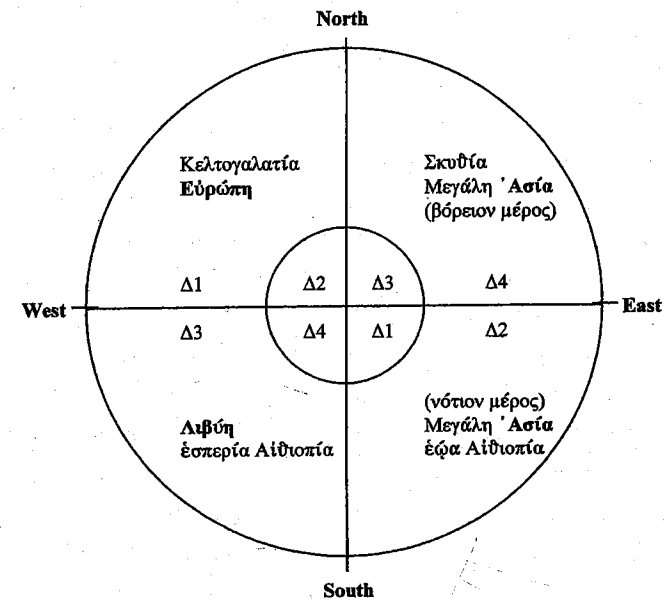
Figure 16: The four quarters and the three continents

In the following paragraphs (2.3.9–11) Ptolemy establishes with great diligence a sort of interpenetration of the effects exercised by the respectively cross-opposite quarters of the triplicities, the north-western and the south-eastern on one side and the north-eastern and the south-western on the other, alleging that the marginal peoples of the οἰκουμένη are governed by the three signs of the triplicity itself, while the peoples situated near the center (*i.e.* near the Mediterranean Sea) assume some of the qualities of the opposite triplicity (as shown in the inner circle of *fig.* 16). So the peoples of Europe (in the north-western triplicity) verging to the center are influenced by the qualities resulting from the opposite south-eastern triplicity of southern Asia and vice versa; and the peoples verging to the center of northern Asia (in the north-eastern triplicity) are

influenced by the qualities resulting from the opposite south-western triplicity of Libya (northern Africa).

All the parts of the four quarters verging to the center are governed not only by the rulers of their respective triplicities, but also, as an additional influence, by Mercury, who grants to these central peoples their faculty of eloquence, humanity, and civilisation, because this god unifies them: διὰ τὸ μέσον καὶ κοινὸν αὐτὸν ὑπάρχειν (2.3.11).

So we find two subsequent binary determinations: first that of the two main directions (between north and west, for example), and second between the more marginal and the more central position. To these cross-related influences we may compare ch. 1.9, where each brillant star (or each little part of the constellations) is determined not by a single planet, but by the influence of a main planet and "a little bit" (ἠρέμα) of a secondary planet.[54]

What Ptolemy explains in the following is too detailed to be repeated here. Take as an example Europe, which belongs to the north-western triplicity (2.3.12–21). In all Ptolemy enumerates eleven regions: Britain, Transalpine Gaul, Germany, Bastarnia (the southern parts of Russia plus southern Poland), Italy, Cisalpine Gaul, Apulia, Sicily, Tyrrhenia (*i.e.* Tuscany), Celtica (perhaps western Spain), and Spain in general. Since the first triplicity is called "ruling" (ἀρχικόν: see *fig.* 5) and its governors are Jupiter (for the north) and Mars (for the west: see *fig.* 13), these peoples are said to be in general independent, liberty-loving, fond of arms, industrious, very warlike with a tendency to leadership, and so on.[55]

In order to make specific this general statement, Ptolemy relates the different countries to the three individual signs of the triplicity (Aries-Leo-Sagittarius):

1. To the Ram and its nighttime ruler (Mars) belong the regions of four ferocious races: Britain, Transalpine Gaul, Germany, Bastarnia, "whence their inhabitants in general are fiercer, more headstrong, and bestial."[56]

2. To the Lion and its ruler (the sun) belong the countries of four more civilized races: Italy, Apulia, Sicily, Cisalpine Gaul: "because these peoples tend more to leadership, being benevolent and cooperative."[57]

3. To the Archer and his daytime ruler (Jupiter) belong the peoples of Tyrrhenia, Celtica, Spain: "whence their independence, simplicity, and love of cleanliness."[58]

After distributing these three groups of distant peoples to the three signs of the north-western triplicity, Ptolemy considers eight other peoples situated near the Mercury-influenced central region of the οἰκουμένη: Thrace, Macedonia, Illyria, Hellas (*i.e.* northern Greece), Achaia (southern Greece: the Peloponnese), Crete, the coastal regions of Asia Minor, Cyprus. Since these regions are placed in the south-eastern angle of the north-western quarter, the principally north-western character of the subjacent peoples is impregnated with qualities of the opposite south-eastern quarter governed by the second triplicity (Taurus-Virgo-Capricorn) and its planetary rulers Venus and Saturn, where one must add the rulership of the central and ubiquitously working Mercury. Since the influences of the two opposite triplicities are overlapping, the inhabitants reveal a mingled constitution of body and soul.[59]

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[54] *Apotel.* 1.9 and the brillant commentary by F. Boll, *Antike Beobachtungen farbiger Sterne (AbhMünch* 30.1 [1916]).

[55] 2.3.13, ἀνυποτάκτοις τε εἶναι καὶ φιλελευθέροις καὶ φιλόπλοις καὶ φιλο-πόνοις καὶ πολεμικωτάτοις καὶ ἡγεμονικοῖς καὶ καθαρίοις καὶ μεγαλοψύχοις.

[56] 2.3.15, ὅθεν ὡς ἐπίπαν οἱ ἐν αὐταῖς ἀγριώτεροι καὶ αὐθαδέστεροι καὶ θηρι-ώδεις τυγχάνουσιν.

[57] 2.3.16, διόπερ ἡγεμονικοὶ μᾶλλον οὗτοι καὶ εὐεργετικοὶ καὶ κοινωνικοί.

[58] 2.3.16, ὅθεν τὸ φιλελεύθερον αὐτοῖς καὶ ἁπλοῦν καὶ φιλοκάθαρον.

[59] 2.3.18, κεκραμένοι τοῖς τε σώμασι καὶ ταῖς ψυχαῖς.

He then describes the effects that the zodiacal signs and their planetary rulers exercise on ethnicity. On the whole, these central peoples owe to Mars (the planet ruling the west) their tendency to leadership, nobility, and independence, and to Jupiter (the planet ruling the north) their liberty-loving, self-governing, and democratic character that induces them to establish many laws.[60]

So much for the peoples situated more on the periphery of the north-western triplicity. As to the peoples placed in the central angle, the influence of their own triplicity is overlapped by that of the opposite south-eastern triplicity: thanks to Venus (the ruler of the second triplicity) the inhabitants are lovers of music and learning, fond of contests and of pure life, and thanks to Mercury (the daytime ruler of the Virgin, one partner of the second triplicity) they are social, friendly to strangers, justice-loving, fond of writing, and very efficacious in eloquence.[61]

Here again Ptolemy modulates the different characters according to the three individual zodiacal signs:

1. To the Bull and to Venus (his nighttime ruler) belong the Cyclades, the shores of Asia Minor, and Cyprus, the "Aphrodisian" island (it is well known that Venus was a marine goddess and worshipped particulary in harbours, centers of prostitution). Hence Ptolemy concludes: "For this reason they are, on the whole, luxurious, clean, and attentive to their bodies."[62]

[60] 2.3.18-19, ἡγεμονικοὶ μὲν ... καὶ γενναῖοι καὶ ἀνυπότακτοι διὰ τὸν τοῦ Ἄρεως, φιλελεύθεροι δὲ καὶ αὐτόνομοι καὶ δημοκρατικοὶ καὶ νομοθετικοὶ διὰ τὸν τοῦ Διός.

[61] 2.3.19, φιλόμουσοι δὲ καὶ φιλομαθεῖς καὶ φιλαγωνισταὶ καὶ καθάριοι ταῖς διαίταις, διὰ τὸν τῆς Ἀφροδίτης, κοινωνικοί τε καὶ φιλόξενοι καὶ φιλοδίκαιοι καὶ φιλογράμματοι καὶ ἐν λόγοις πρακτικώτατοι διὰ τὸν τοῦ Ἑρμοῦ. There is a strange addition about mysteries: see n.69 infra.

[62] 2.3.20, οἱ μὲν περὶ τὰς Κυκλάδας καὶ τὰ Παράλια τῆς Μικρᾶς Ἀσίας καὶ Κύπρον τῷ τε Ταύρῳ καὶ τῷ τῆς Ἀφροδίτης μᾶλλον συνοικειοῦνται, ὅθεν ὡς ἐπὶ τὸ πλεῖστον τρυφηταί εἰσι καὶ καθάριοι καὶ τοῦ σώματος ἐπιμέλειαν ποιούμενοι. The last effect is mentioned already by the Augustan poet Manilius for the Bull, which is considered the first female sign and accompanied by the seven Pleiades (5.146-147): cura sui cultus frontisque decorae / semper erit; see Hübner (supra n.27) 542.

2. To the Virgin and to Mercury (her daytime ruler) belong northern and southern Greece and Crete, because "they are better in reasoning and fond of learning and exercise the soul in preference to the body."[63]

3. To the odd Capricorn and to Saturn (his daytime ruler) Ptolemy attributes the races of northern Greece: the Macedonians, Thracians, Illyrians, "because they are acquisitive, but not so gentle, nor social in their institutions."[64] In this way the extreme southern sign of the south-eastern triplicity (Capricorn) approaches the fiery character of the primarily determining north-western triplicity.

This is only the first of the four triplicities concerning Europe placed in the north-western part of the οἰκουμένη. The influence exercised by the opposite second south-eastern triplicity is answered by a reciprocal influence from the north-western triplicity which returns its influence back to the south-eastern triplicity. A similar cross-interpenetration combines the two other triplicities: the north-eastern of northern Asia and the south-western of Africa.

The levels of all these manifold parallelisms are extremely different: in a sort of spiritual "catch as catch can" astrologers picked up whatever they could find to use as a reasonable argument.[65] Let us take only three domains concerning mythology, religion, and science. The association of Saturn with Venus governing the south-eastern triplicity leads to the property σπερματικόν ("rich in seed," 2.3.24), and this is based on the aetiological myth of Kronos' genitalia which, thrown into the sea, generated Aphrodite. In order to explain the combination of the moon with the Amazons, Ptolemy pretends that the female

[63] 2.3.21, διὸ μᾶλλον λογικοὶ τυγχάνουσι καὶ φιλομαθεῖς καὶ τὰ τῆς ψυχῆς ἀσκοῦντες πρὸ τοῦ σώματος. Cf. on the Virgin Manil. 4.194: illa decus linguae faciet regnumque loquendi, with Hübner (supra n.27) 561.

[64] 2.3.21, διὸ φιλοκτήματοι μέν, οὐχ ἥμεροι δὲ οὕτως οὐδὲ κοινωνικοὶ τοῖς νομίμοις.

[65] For further details see Boll (supra n.9) 199-200.

σελήνη has an "oriental and manly shape,"[66] although (we may add) the moon in general is related to the west.[67]

As for religion, of the two planets of the south-eastern triplicity Venus creates, in Egypt, worshippers of Isis, and Saturn, in Asia Minor, worshippers of Mithras-Helios,[68] and Venus alone hints at mysteries "because of her western shape,"[69] which contradicts her southern position (see *fig.* 13) and can only mean that, as a partisan of the moon (see *fig.* 14), she belongs to the night and to the west.

Finally science: in Babylonia, Mesopotamia, and Assyria the Virgin is said to generate astrologers, who observe and calculate the motions of the five planets, because the Virgin is the day house of Mercury, the astrologer's planet *par excellence*.[70]

In conclusion, we may ask why Ptolemy preferred this extremely complicated combination of quarters and triangles instead of working with the clearly determined four edges of the world. One reason may be that he wanted to counter a serious argument advanced against zodiacal geography in general, pronounced since Carneades and Panaitios and repeated by Christian writers.[71] These critics remarked that all parts of the inhabited world are populated with all kinds of mankind, and if the stars determined the character and behavior of entire

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[66] 2.3.40, διὰ τὸ τῆς σελήνης ἀνατολικὸν καὶ ἠρρενωμένον σχῆμα. See Boll (*supra* n.9) 201–202.

[67] 2.2.10 of the western region, τοῦτο τὸ μέρος σεληνιακὸν τυγχάνει, πάντοτε τῆς σελήνης τὰς πρώτας ἐπιτολὰς καὶ ἀπὸ συνόδου φαντασίας ἀπὸ λιβὸς ποιουμένης. διὰ δὴ τοῦτο νυκτερινὸν δοκεῖ καὶ θηλυκὸν καὶ εὐώνυμον, ἀντικείμενον τῷ ἀνατολικῷ. In the Amazons we encounter a sort of "antipathy."

[68] 2.3.23, σέβουσί τε γὰρ τὸν μὲν τῆς Ἀφροδίτης Ἶσιν ὀνομάζοντες, τὸν δὲ τοῦ Κρόνου Μίθραν Ἥλιον.

[69] 2.3.19, μυστηρίων δὲ μάλιστα συντελεστικοὶ διὰ τὸν τῆς Ἀφροδίτης ἑσπέριον σχηματισμόν.

[70] Hübner (*supra* n.23) 127 and n.2.

[71] Panaitios *ap.* Cic. *Div.* 2.97, *plus terrarum situs quam lunae tractus ad nascendum valere* (see the parallels given by A. S. Pease *ad loc.*), and principally Bardesanes *Liber regionum*, quoted by Eus. *Praep.Evang.* 6.10 and by others (= *FrGrHist* 719 F 3). See Boll (*supra* n.9) 183–187; Bouché-Leclercq 584–585.

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peoples, individuals would be more homogeneous. And if, on the other hand, foreign individuals move from their homes into another country, they do not change, but normally retain their original character. Ptolemy counters this criticism with relativism, the favourite of all astrologers, who cautiously avoided predictions too clearly pronounced. Franz Boll[72] has shown that in the philosophical discussion, here again Ptolemy is not original—although he does not depend on Poseidonios, as Boll believed—but when he united his astronomical and his geographical interests relating the variegated terrestrial ποικιλία of mankind to the city of stars (the heavenly Λυχνόπολις), and when he implemented the general strategy of relativism with an extremely sophisticated astrological cross-interdependence of opposite triplicities, this seems to have been his own invention.

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[72] Boll (*supra* n.9) 204–235, esp. 204: "In Wahrheit ist er auch dazu lange nicht selbständig genug gewesen."