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# **Astronomy and Psyche in the Classical World: Plato, Aristotle, Zeno, Ptolemy**

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## **Abstract**

The history of classical astronomy tends to emphasise the development of mathematical astronomy and the origin of astronomical instrumentation. Religious and philosophical issues are generally dealt with separately. However, the practice of classical astronomy was conducted within a context in which the cosmos was permeated with soul, or *psyche*. This paper examines the work of Plato, Aristotle, and Zeno, and applies theory of "psychological astronomy" to the classical world, so as to provide a context and understanding of the motive for the development of mathematical astronomy, concluding with the work of Claudius Ptolemy.

**Keywords:** Ancient Greek Cosmology, Plato, Aristotle, Zeno, Ptolemy, Psychology, Soul, Stoics,

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## **1. Introduction**

We can distinguish at least four schools of theoretical cosmology in the classical Greek world: the Platonists, Aristotelians, Stoics and Atomists (Campion 2009a). To this list we might add the religious edifice of celestial deities evident in written accounts since Hesiod's *Theogony* (1972), but in this paper the focus is on the four philosophical schools in view of their body of speculative literature. Of these four, the first three, the Platonists, Aristotelians and Stoics, regarded the cosmos, in their various ways, as meaningful, purposeful or characterised by the connection of all things, either psychically, physically or through networks of causation; only the Atomists inhabited a directionless, meaningless cosmos and, I would argue, theirs' was very much a minority view. In spite of their substantial differences, Platonists, Aristotelians and Stoics all agreed that the entire cosmos, in both its terrestrial and celestial parts, was bound together by *psyche*. From an individual perspective, the cosmos therefore possessed an interior aspect as much as an external one, and astronomy was a psychological practice as well as an observational or mathematical one, the evidence for which is scattered throughout the philosophical literature of the classical world. At the heart of all these models was the notion of the cosmos either as divine or as a path to the divine.

## **2. Plato: the Soul Mainly Transcendent**

The conventional structure of the classical world finds its earliest extant form in Plato's works, in which we encounter a geocentric cosmos with the earth at the centre, surrounded by crystalline spheres on which planets rotated, with the fixed stars at the outermost limit (1914c 108E-109A, 110B, 1931,

46D-47A, 1937, X.614-621). However, the concern here is with the moral structure of the universe was based on the premise that the world emanated from the mind of God and was permeated by soul. The initial phase in the Platonic creation myth involved the development of the world soul, out of which matter itself was created. In spatial terms, the cosmos, though inherently perfect, therefore became ever more degenerate as it became more distant from the creator. The fixed stars, whose appearance never changed were most divine, being closest to God, while the planets become steadily less divine as the crystal spheres on which they revolved moved closer to the earth in the order Saturn, Jupiter, Mars, Mercury, Venus the sun and, lastly, the moon, whose rapidly changing appearance was proof of its profound imperfection. Eventually we arrive on the earth which is round and held at the centre of the universe by the whole system. Plato defined the planets as gods (1931 30D, 41A) in the sense that they are beings borne of the same living, divine material as the rest of the cosmos, but the individual human soul was to have a direct relationship with the fixed stars, its location between incarnations in material form (1931 41E-42A, 1937, X.614-621).

The concept of the relationship between soul and stars finds its fullest expression in Plato's psychological theory - his view on the nature and function of *psyche* - which, in turn needs to be understood in terms of his theory of the soul's origin in the stars and classification into different functions. As Bartel van der Waerden argued, Plato's theory of soul takes us to the heart of the development of this particular feature of Greek astronomy: "The soul comes from the heavens", he wrote, "where it partook of the circulation of the stars. It unites itself with a body and forms with it a living being. This explains how human character comes to be determined by the heavens"

(van der Waerden 1974, p. 147). Each soul, Plato wrote in *Timaeus*, has its own star (1931, 41E-42A). He was, of course, speaking metaphorically but, in his view, metaphor was often the most effective means of revealing truth.

Plato set out his theory of the soul's origin in the stars in *Timaeus* and elaborated it in the *Republic* (1937, X.614-621) in which the precise mechanics of the soul's incarnation into human form were set out: it originates in the sphere of the fixed stars, to which it later returns, following a descent and ascent through the planetary spheres. Plato's text gives an account of the means by which the soul selects a possible life and then descends through the planetary spheres to the Earth, a process during which its future fate is determined. From the cosmogony which is so carefully set out in *Timaeus*, we can draw two significant conclusions. The first is that soul pervades the entire cosmos. The second is that soul takes priority over matter. Plato was most emphatic on this point. 'God', he wrote, 'constructed Soul to be older than Body and prior in birth and excellence, since she was to be the mistress and ruler' (1931, 34C). "Soul", he wrote in *Phaedrus*, "has the care of all that is soulless" (1914a, 246 b-c). It exists independently of body and may incarnate - or may not. The Cosmos, for Plato, was a "Living Creature endowed with soul and reason owing to the Providence of God" (1931, 30B-C). The concept of the entire universe as alive and resting in soul, or *psyche*, also enabled Plato to see the cosmos as psychological in the modern sense, as having personality, driven by manners, habits, opinions, desires, pleasures, pains and fears (1914b, 207E).

Plato's ideas on the soul evolved throughout his various writings. However, as with his cosmology, we can generalise. The divine unfolded in stages, first through soul and mind,

and finally through its self-realisation in physical form. Human beings, Plato believed, consisted of four different parts; on the one hand, the body and, on the other a soul divided into three.

In *Phaedrus* he represented this three-fold structure as a charioteer and his two horses (1914a, 246A, 253C-D). The highest part, as he explained in *Timaeus*, was the charioteer himself, the rational soul, mind or intellect, which discerns what is true, judges what is real and makes rational decisions (1931, 28A). Next was the spirited soul, the active part, the will, whose function was to carry out what reason has decided. Last, and lowest, was the appetitive soul, the seat of emotion and desire, which needed to be restrained by the higher, rational, soul if the individual was to be saved from self-destructive behaviour. Sometimes these three souls are regarded as distinct, separate entities, but it is better to see them as functions which exist on a smooth spectrum from the rational to the emotional, an extension of the emanationist principle of Platonic cosmogony, in which all existence emerges in a continuous flow from the creator. There is no firm dividing line between the human and the divine in Platonic theory and, significantly for the understanding of Plato's astronomy, none between humanity and the stars: all are embedded in the world soul, of which individual souls are a part (1931, 41D-E).

We might view Plato's model of the soul's relationship with the stars as leading, variously, to enlightenment or salvation, in which respect he issued the following inspirational advice: "we ought to fly away from earth to heaven as quickly as we can; and to fly away is to become like God, as far as this is possible; and to become like him, is to become holy, just, and wise" (Plato 1949, p. 41). The consequence of engagement

with the stars might, for Plato, be psychological transformation. God himself was rational and it was the very act of observing the motions of the stars and planets which enhanced rational powers in the observer and drew him or her close to God, the source of reason, of thought and goal of all intellectual inquiry (1931, 28C, 41B, 42E, 47C). Theology and psychology are therefore, in Plato's terms, inseparable. The theme was taken up from a Stoic perspective by Marcus Manilius, one of the few classical astrologers to have written in Latin. In his *Astronomica*, composed probably at the end of the first century BCE, Manilius drew attention to the rational soul's role in astronomy:

Who could know heaven save by heaven's gift and  
discover God save one who shares himself in the divine?  
Who could discern and compass in his narrow mind the  
vastness of this vaulted infinite, the dances of the stars,  
the blazing dome of heaven...had not nature endowed our  
minds with divine vision, had turned to herself a kindred  
intelligence...? Who, unless there came from heaven a  
power which calls us heavenward to the sacred  
fellowship of nature? (Manilius 1977, 2.115-129).

The belief that to engage with the stars in a contemplative manner might benefit one's soul proved an enduring feature of the deep Platonic strain in classical cosmology. Typical was the Roman emperor Marcus Aurelius (1964, p. 112), who was deeply influenced by both Plato and the Stoics, and who prescribed the following remedy for world-weariness in the second century CE.: 'Survey the circling stars as though you yourself were in mid-course with them. Often picture the changing and re-changing dance of the elements. Visions of this kind purge away the dross of our earth-bound life'. One's

soul, the emperor believed, might be cleansed by means of an imaginative union with the stars.

### **3. Aristotle: the Soul Partly Embedded in Matter**

Aristotle's theories parallel Plato's in his use of a tripartite division, but differ in his emphasis on the embodiment of *psyche* in matter; whereas, for Plato, soul was both immanent and transcendent, in matter and above it, Aristotle seriously restricted its transcendent portion. The Aristotelian soul, like the Platonic, is a kind of animating force, without which the natural world could not operate. "Soul", Aristotle wrote, "is substance in the sense of being the form of a natural body, which potentially has life. And substance in this sense is actuality. The soul, then, is the actuality of the kind of body we have described" (1936, II.I.412a). That is, it is soul, exactly as in the Platonic sense, which allows matter to live and turns human beings into individuals. Soul is the "cause" of the body, and so, in a sense, has priority over it (1936, II.IV.415b).

Like Plato, Aristotle also employed a tripartite division of the soul into three levels, which were arranged hierarchically, in ascending order from the lowest, the 'nutritive' (possessed by plants, animals and people), to the sensitive (possessed by animals and people, but not plants) and, finally, the highest, the intellectual (possessed by people alone) (1936, II.III.414a-b). Aristotle's descriptions of the lower two souls differ slightly from Plato's equivalents. For example, Aristotle's sensitive soul is that which allows individuals to use their senses, such as sight and touch, and cope with the desires, pains and pleasures which the senses arouse; the sensitive soul has to deal with the consequences of physical desire.

Although, unlike Plato, Aristotle did not explicitly relate the soul to the stars, he did presuppose a world in which the entire terrestrial realm is connected to the celestial spheres and the soul-star connection is therefore implicit. Even though Aristotle proposed that the physical composition of the cosmos in the sublunary realm, consisting of the four elements, differed from that above, which was composed of ether, but he also postulated a fundamental unity which connected stars to earth, and hence, implicitly, to the soul:

The whole terrestrial region then is compounded of these four bodies [fire, earth air, water] and it is the conditions which affect them which, we have said, are the subject of our inquiry. This region must be continuous with the motions of the heavens, which therefore regulate its whole capacity for movement. For the celestial element as source of all motion, must be regarded as first cause (1937, 339a.19-24).

For Aristotle, the soul's relationship with celestial motions may not have been explicit, but it was implicit: the soul is moved by the heavens which are themselves, animate. 'The fact is' he wrote, 'that we are inclined to think of the stars as mere bodies or units, occurring in a certain order but completely lifeless; whereas we ought to think of them as partaking of life and initiative. Once we do this, the events will no longer be surprising' (1921, II.xii.292a). The cosmos, therefore was alive and purposeful. Moreover, with the exception of a fragment of the intellectual soul, the "agent" or "active" intellect, the Aristotelian soul was entirely embedded in the material world (1936, III.V.430a; Caston 1999 p. 199).

#### **4. Zeno of Citium: The Soul Entirely Embedded in Nature**

The naturalistic perspective was adapted and emphasised by the Stoics, founded by Zeno of Citium (c.334-262 BCE). Zeno shared much with Plato, in particular the concept of an intelligent, reasoning cosmos. However, whereas Plato insisted that psyche, as intangible consciousness was the source of the material world, Zeno insisted that matter, rather than soul, was the origin of everything. Indeed, for the Stoics, there was nothing in this cosmos which could not have physical form. Even 'voice', Zeno claimed, was a "body". (Diogenes Laertius, 1925, VII.156-7).

Zeno's concept of the soul bears comparison with Aristotle's: his work on the soul is lost but we have an account of his ideas from the summary by Diogenes Laertius in the third/fourth centuries CE. "They believe", Diogenes Laertius wrote of the Stoics (1925, VII.156-7), "that...soul is a nature capable of sense-perception. And this soul is the inborn *pneuma* in us...by this means we live and breathe and by this we are moved'. The Stoics shared with Plato the notion of a cosmos which was permeated by the world soul and in which all things, including emotions, thoughts and bodies, were intimately connected. For the Stoics such connections operated through webs of "sympathy" and, being universal, connected stars to people (1925, VII.134,140-2).

#### **5. Psychological Astronomy**

The development of the term "psychological astronomy" (Campion, 2009b) to describe the psychological application of astronomy recommended by Plato, is derived from various commentaries on Aristotelian cosmology. In particular,

Christopher Shields (2007, p.270) considered what he called the "psychological" applications of Aristotle's hylomorphism. Hugh Lawson-Tancred (1986) spotted the potential importance of Aristotle's theories for modern psychology when he asked of Aristotle's intentions, "is he not directly anticipating the Physicalist theories so dominant in contemporary philosophy of psychology?" Thus, it is argued, that the Platonic, Aristotelian and Stoic models of astronomy contains a psychological strand and carry psychological consequences and applications (Campion, 2009b).

## **6. Claudius Ptolemy: Practical Applications**

The theoretical cosmic psychologies proposed by Plato, Aristotle and Zeno found their practical application in the work of Claudius Ptolemy, the last of the great astronomers of the classical world (Jones, 2010). Ptolemy has a claim to being the most influential of classical astronomers on account of the respect with which his encyclopaedic work on mathematical astronomy, the *Syntaxis*, or *Almagest*, was held, first in the Islamic world, and then in Medieval European culture. While the *Almagest*, is usually the centre of attention when Ptolemy's astronomy is examined, if his cosmology is to be understood on its own terms, its purpose cannot be understood independently of two of his other works, the *Harmonics* and the *Tetrabiblos*, in both of which he raised the soul's relationship with the stars.

Ptolemy appears to have drawn his philosophical influences from Platonists, Aristotelians and Stoics. Sambursky (1987, pp. 140-5), for example, identified the origin of Ptolemy's regard for the independence of planetary motions in Platonic notions of the living cosmos. However, as Robbins (1949, p

ix) noted, he also appears to have been deeply attracted to Aristotle's philosophical naturalism. Liba Taub (1993, p. 15), meanwhile, drew attention to the discussion of possible Stoic influences on Ptolemy. However, rather than adhering to one philosophical school, Ptolemy was typical of philosophical thought in the second century CE in which "pure" forms of earlier philosophical schools had been replaced by syncretism in which facets of each could be combined in various forms. We would therefore expect to see him drawing on all earlier notions of soul.

Ptolemy divided the work of the astronomer into two phases: the first was concerned with the measurement of celestial positions, which we find in the *Almagest*, the second with the measurement of their effects, which he discussed in the *Tetrabiblos*, and which is one of the foundations of western astrology (Ptolemy 1940, I.1). Those effects might be felt in the natural world but also in the psychological, the realm of the soul. Ptolemy's psychological astronomy can be divided into two forms, the contemplative and the analytical. The first was devoted to the contemplation of the cosmos with a view to attaining personal peace and harmony (Taub, 1993, p. 137), and clearly draws him into the Platonic orbit. The second which is set out *Tetrabiblos*, required the use of planetary motions to analyse the condition of the individual soul. The two forms of psychology come together in that the latter, by providing foreknowledge of predetermined events, calms the soul; by knowing that the future is inevitable, one accepts it with grace. As the Stoic philosophers had claimed, the virtue which encourages a calm soul and cautious action comes from a knowledge of what one must do (Diogenes Laertius 1925, 91, 92-3, 122, 126). And, as Plato argued, a knowledge of philosophy, in which he included astronomy, leads to happiness (Plato, 1914a, 256 A-B).

In the Stoic conception, which was undoubtedly an influence on Ptolemy, animals were compelled to action by a movement in the soul/*psyche* called the *hormê* – an impulse or drive (Sandbach, 1975, pp. 60-1). There is a kind of celestial mechanics at work here, in which the movement of a planet is connected to a disturbance in the individual soul, and with a consequent tendency to action. In the *Tetrabiblos*, though, Ptolemy is concerned with the symptoms of such motions – their manifestation in the psychology of the individual, rather than the mechanics by which the stars and planets act as causes. The planets' psychic or psychological, and physical functions were related to the essential nature of the cosmos, as well as to humanity, a system in which person and planet, mind and body, were absolutely interrelated.

Ptolemy's preferred model of the soul appears to have been a version of the Platonic-Aristotelian three-fold division arranged in hierarchical order, in the Platonic sense, as rational, emotional and "cupidinous" (2000, III.96.27). Whether his principal source for the tripartite division was Plato or Aristotle (the distinctions resemble the Platonic rather than the Aristotelian, but his naturalism is closer to Aristotle than to Plato), in his Platonist and Stoic personas he would have believed that self-control of the lower two parts of the soul was necessary if the rational-intellectual part was to achieve its full potential. He also divided the rational soul into seven qualities all of which are varieties of sharp, critical thinking, experience and wisdom, in an apparent - but undefined - analogy with the planets, which are not, though, mentioned explicitly (2000, II.12-13). Ptolemy's purpose was to describe the soul's life within nature.

According to Stoic teachings, the natural world was something to accept gracefully, not an arena of suffering from

which to escape. The soul was then embedded, in Pythagorean style, in a series of mathematical formulae and musical scales related to the zodiac signs and planets. The rising of Mercury and Venus, for example, related to a particular sound, a harmony which, if one could hear it, would represent the perfect contemplation of the divine.

Ptolemy set out his detailed rules for identifying the condition of the soul, or *psyche*, in the *Tetrabiblos*, composed around 120 CE, although there he appears to have been concerned only with two levels of the soul (1940, III.13), rather than, as in the *Harmonics*, three. He compressed the three levels of soul, for astrological purposes, into two, the "rational" and "irrational". Also, whereas Plato had written of the soul's descent through the planetary spheres, but retained its primary theoretical relationship for the stars, Ptolemy identified the positions of the planets as sources of the soul's quality. In Ptolemy's view the higher of the two souls was the 'rational' the character of which, he claimed, was determined by the placing of Mercury. The lower part, the "irrational", was characterised by the Moon and its associated stars. Ptolemy had taken Plato's system, in which the descent through planetary spheres infers a relationship between planet and soul. Also, apparently relying on Aristotle's scheme, he associated the intellectual, or rational, soul with Mercury and both the nutritive and sensitive souls to the Moon, writing that

Of the qualities of the soul, those which concern the reason and the mind are apprehended by means of the condition of Mercury...and the qualities of the sensory and irrational part are discovered from the one of the luminaries which is the more corporeal, that is, the moon (1940, III.13).

From these simple rules the classical astronomer – and astrologer - might then construct a simple psychological analysis. Mercury and the Moon located sympathetically might denote a pleasing character but, if in a difficult relationship according to the rules Ptolemy set out, the personality would be beset by difficulties. We know that this system was still in use by the time that Galileo cast the horoscopes for his daughters (Galileo, no date, pp. 21-2, 24-6, 29).

## **7. Conclusion**

An understanding of classical astronomy, and of the history of western astronomy in general, should take into account the context provided by conceptions of the cosmos within which mathematical models of planetary and stellar motion were situated. However, the widespread belief that soul pervaded the material universe provided one such context, even though Platonic, Aristotelian and Stoic versions of the relationship between soul, nature and stars, differed. The term and concept of "psychological astronomy" has been developed in order to make a contrast with mathematical astronomy.

Claudius Ptolemy's work provides a key example of the practical application of psychological astronomy, which can be divided into forms: psychological astronomy of the contemplative variety provided the overall motive within which Ptolemy's analytical psychological astronomy and his mathematical astronomy can be understood. The significance of contemplative psychology for his mathematical astronomy is set out in the opening passage of the *Almagest* in which, as a Platonist, Ptolemy recognised that divinity stood at the heart of his cosmology. What he imagined, in his cautious way, as

divinity, was described in Aristotelian terms as the "first cause of the first motion of the universe', impersonal and remote, like an 'invisible and motionless deity" (Ptolemy 1998, I.1). His goal, he wrote, was to "strive for a noble and disciplined disposition...to devote most of our time to intellectual matters, and especially those to which the epithet "mathematical" is particularly applied" (Ptolemy 1998, I.1).

In words which both Plato and Marcus Aurelius would have recognised, Ptolemy defined the purpose of astronomy as to increase "the love of the contemplation of the eternal and unchanging", the divine source of all life in the cosmos (1998, I.1). In his short poem, the *Anthologia Palatin* he imagined his soul – his *psyche* - extending to the stars "I know that I am mortal, the creature of one day. But when I explore the winding courses of the stars, I no longer touch with my feet the Earth: I am standing near Zeus himself drinking my fill of Ambrosia, the food of the Gods" (Luck, 1987, p.348).

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