

God's Life-Generating Power and Its Transmission in Aristotle's Biology and Cosmology

Is it possible that Aristotle presented three very different phases in his philosophy and that only one of these was scientifically important? Such was Werner Jaeger's claim in 1923, and still there is no alternative theory.

Is it likely that, during his lectures in the Peripatos, Aristotle talked about a vital *pneuma* connected with the soul as the principle of life, but that *pneuma* plays no role in his seminal work *On the Soul*?

Is it conceivable that he called God the "Great Leader" of the cosmos, but saw no divine governance in Nature?

These critical questions about the standard theory on Aristotle have spurred the author of this book to develop a perspective on Aristotle's philosophy that breaks with the accepted view.

A crucial part is assigned to *pneuma* as the vital principle in all that lives. *Pneuma* is the fine-material carrier of all psychic functions and is governed by the soul as entelechy. The soul is the principle that controls the activity of *pneuma* in a goal-oriented way (oriented, that is, to the form of the living being). The entelechy is a cognitive principle that acts on the vital *pneuma* and is active from the very beginning of life, as a kind of automatic pilot. In human beings, however, the entelechy can also be "awakened" to intellectuality. All entelechies of living beings, including those of the stars and planets, are actuated by the Power that proceeds inexhaustibly from the divine, transcendent Intellect.

This book also defends the authenticity of *On the Cosmos (De Mundo)*, because this work does not present God as "Maker" but as "Begetter" of the

cosmos. The same case is put for Aristotle's authorship of *On Pneuma* (*De Spiritu*), because Aristotle had to explain how there could be vital processes in plants and trees and in embryos and eggs, which do not possess respiration. Hence, he introduced *pneuma* as principle of vital heat, which is already present and active before the formation of lungs that enable breathing.

Many experts on Aristotle's work are in no doubt that he attributed a preeminent role to God in his philosophy of nature and cosmology. On the other hand there are authors who find it difficult to formulate the importance of God in Aristotle's analysis of everyday natural phenomena.¹ My intention is to describe how Aristotle held that nothing in the cosmos can exist independently of God, its ultimate Cause, whereas the existence of God depends on nothing external to him.

In this study I will first list some particulars about God's role in the Aristotelian system (in chapters 2–5). I will deal there with texts in which Aristotle talks about the dependence of the visible world on God and the degrees involved in this dependence. I will also discuss the structural desire for immortality and the condition of God in everything forming part of the cosmos, and the “love” (*erôs*) for God, which is a way in which this desire may also manifest itself.

I then explore how these particulars are related to one another and to other elements of Aristotle's philosophy, especially to *his theory of reproduction*, which I discuss in chapters 6 and 7.² In these chapters I consider how Aristotle came

1. W. D. Ross, *Aristotle's Metaphysics. A Revised Text with Introduction and Commentary*. II vols. (Oxford: Clarendon Press, 1924), vol. 1, cliii stated: “It is exclusively as first mover that a God is necessary to his system.” Ross viewed *Metaphysics* Λ as the only specimen of Aristotle's “mature” theology; D. Frede, “Theodicy and Providential Care in Stoicism,” in *Traditions of Theology. Studies in Hellenistic Theology*, ed. D. Frede, and A. Laks (Leiden: Brill, 2002), 86: “How little Greek philosophers thought of direct divine interference in worldly affairs at the end of the classical age is shown above all by Aristotle's Unmoved Mover whose thoughts are concerned exclusively with himself, because contact with inferior objects would mean a lessening of his perfection.” S. Menn, “Aristotle's Theology,” in *The Oxford Handbook of Aristotle*, ed. C. Shields (Oxford: Oxford University Press, 2012), 422 noted: “This way of thinking about Aristotle's theology is not entirely false, but it is badly misleading.” I myself prefer the position taken by J. E. Whiting, “Locomotive Soul: The Parts of Soul in Aristotle's Scientific Works,” *Oxford Studies in Ancient Philosophy* 22 (2002): 144: “the prime mover . . . can exist apart from all other things, none of which can exist apart from it.”

2. For a diametrically opposite interpretation of Aristotle's theology, see R. Bodéüs, *Aristote et la Théologie des Vivants Immortels* (Québec: Éd. Bellarmin, 1992); Eng. ed. *Aristotle and the Theology of the Living Immortals* (Albany: State University of New York Press, 2000). He defends the remarkable position that Aristotle did hold a cosmic theology, closely attuned to traditional Greek conceptions, but not a meta-cosmic theology. According to Bodéüs, the notion of a transcendent Unmoved Mover, as proposed in *Metaphysics* Λ , is not Aristotelian, but came to be attributed to Aristotle through the influence of the treatise *On the Cosmos* (*De Mundo*), which Bodéüs dates to the beginning of the Christian era—Eng. ed., 33–34.

to see the life of plants and trees and the vegetative, nutritive or reproductive function of animals and humans as the most general function of life in the sublunary sphere, and the first in the development of all living creatures. This function is essential to all mortal living entities, but does not depend on respiration or breath. It is already active before the birth of living creatures, from the moment of fertilization or conception. Focusing on this subject, Aristotle started to wonder how specific identity (the *eidōs*) is determined for a new living being from the moment of fertilization, and what agency is responsible for producing the new being, since that agency cannot be an immaterial soul that enters a previously formed embryo from outside. This led Aristotle to draw up his entirely new theory of the soul as carrier of specific form and as entelechy of a pneumatic instrumental body. His radical new outlook on the genesis of life also led Aristotle to describe God's relationship with the cosmos caused by him in a very different way from his predecessors Plato and the Presocratics (chapter 9). For Aristotle, God is not an entity that produces the world as a Creator or Demiurge. He is, however, the cause of all things, such that Aristotle is convinced of a divine design of the cosmos. Aristotle's view of the cosmos is "teleological," because everything functions in the best possible way, not through an external entity that creates something as a producer, but through an internal power, in the same way that this works in a grain of wheat or in an embryo. God is the cause of the cosmos as the source of all order, structure and governance, which manifests itself in a material reality that is subservient to this order and structure.

In the theory developed here, Aristotle's concept of *pneuma* plays an important role. In other views on Aristotle his theory of *pneuma* seems strangely disconnected, as if scholars are at a loss what to do with it. The divine element, ether, and *pneuma* (in the sublunary sphere) are instruments functioning as bearers of the divinely emanating Power that brings about order and structure. All facets of *pneuma* as sublunary analogue of the astral element ether will be discussed in chapter 10. A number of important questions that often are neglected will be considered there:

Can *pneuma* be a "natural body"?

Does it have its own natural motion or its own natural place?

Is *pneuma* an independent, sixth natural body alongside ether and the four sublunary elements?

What does it mean that *pneuma* is an analogue of the astral element?

Why can't it change into one of the sublunary elements and why doesn't it share any common matter with these elements?

Is *pneuma* (infinitely) divisible?

Is *pneuma* imperishable or can it be affected by old age and disease?

Should *pneuma* be regarded as an efficient cause, or is it also the material cause of living beings?

How is it possible that *pneuma* pervades other natural bodies?

Is this also the reason why *pneuma* is invisible?

How is "vital heat" related to *pneuma*?

And finally, as the most important question: How is the soul as entelechy the rei(g)ning principle of *pneuma*? If we succeed in understanding this, it is possible to fathom Aristotle's teleological view of nature.

This requires us to consider in a new way the question: What is the meaning of Aristotle's proposition: "In being soul there is sleep and waking"?³

In chapters 12–17 I try to show why an entirely unhistorical outlook on Aristotle's philosophy has become dominant since Antiquity from the time of the teaching and commenting activities of Alexander of Aphrodisias (2nd century CE), an outlook that cancels any connection between his theology and his doctrine of reproduction and life in the sublunary sphere.

Chapters 18–19 provide a summarizing overview of the problems discussed. Chapter 19 especially can be read as a short summary of the line of argument developed in this book.

My working hypothesis in this study is that Aristotle's philosophy proposed a drastic correction of Plato's views. The most fundamental correction was his rejection of Plato's doctrine of the soul and his own sharp distinction of intellect and soul instead of it. Aristotle did not view God as a perfect Soul and Demiurge, but as a pure, transcendent Intellect.

Distinguishing the Intellect from the Soul, Aristotle could not accept the three "parts" of the soul posited by Plato in his famous myth about the soul in the *Phaedrus*. Of the three parts, solely "the driver" of the team of horses remained as First Principle and Cause of everything. But an essential connection with the "psychic" components was maintained. To this "driver" Aristotle attributed a guiding influence, as a "Leader" (κοίρανος, στρατηγός, ἡγεμών, οἰκονομος) and Chief Intelligence Officer. It was impossible that this driver could "strive" or "desire" or even "will." Nor could this driver be the Maker of the elements of the cosmos, as Plato had posited, because this would clash with the dogma of the unchangeability of the First Principle. Only intellect-principles or guiding principles can proceed from the divine Intellect.

3. Cf. *Anim.* II 1, 412a9–11; a19–28 and §10q below for a radical new interpretation of this crucial distinction.

They are the soul-principles, which Aristotle saw as representatives of God's procreative Working Power in all that lives, as guiding principles that are active in organization and production, clothed in a fine-material body consisting of ether or (in the sublunary sphere) *pneuma*. In order to understand Aristotle's theology, we must recognize that the guiding *Dynamis* of the Great Cosmic Helmsman is active in all entelechy-principles⁴ in the cosmos with their instrumental bodies, as in the horses that draw the chariot containing the driver in Plato's famous comparison.

However, in talking about the cosmos Aristotle exchanged the metaphor of artisanal production (by a divine Demiurge) for the biotic metaphor of the transmission of life in reproduction.⁵ His radically new insights into reproduction and his different outlook on "life" inspired him to speak about God as "Begetter" of all forms of life in the cosmos through the Power (*Dynamis*) proceeding from him, as a critique of Plato's concept of the Demiurge and the World Soul. What is vitalized by that divine Power is the *materies*, "the underlying," the female contribution to all what lives. This Working Power of God differs from God's Essence by manifesting itself in a natural body differentiated into a multitude of divine astral beings, who in turn are productive as efficient causes of countless life forms of mortal creatures, with the results of spontaneous generation and plants and trees as last and lowest species. In this view, unensouled bodies as "dead matter" are residual products of the unlimited fullness of life in which God's vitalizing Power displays itself.

The distinction that Aristotle drew between God's Essence and Power is grounded in the distinction between pure theoretical knowledge and guiding activity resulting in action and production. Plato had seen these as two facets of the one divine Intellect. Aristotle strictly separated the two, as Intellect on the one hand and Logos or Rational Soul on the other. The distinction involves an internal dialectic in Aristotle's system, the same kind of tension that was present in Plato's doctrine of the Demiurge. This dialectic is the basis of what in later systems, including the Gnostic world views, is often called "the split in the Deity."

Aristotle presented this philosophy to his contemporaries in the dialogues that he himself published during his lifetime, but also in the lectures that he gave at the Lyceum, of which most of the extant writings are the result.

4. In his surviving works Aristotle never explained what he means by the term *entelecheia*. In any case the standard exegetical tradition should be rejected. For an alternative, cf. §10q below.

5. His motivation for that was made clear by S. Broadie, "Why no Platonistic Ideas of Artefacts?" in *Maieusis: Essays in Ancient Philosophy in Honour of Miles Burnyeat*, ed. D. Scott (Oxford: Oxford University Press, 2007), 232–52.

In those lectures he could refer to his published works and he supposed his audience to be acquainted with them.

What are the advantages of this approach over the standard explanation of Aristotle's philosophy? It shows that Aristotle's philosophy was coherent and consistent, and was driven by new insights that forced him to reject Plato's doctrine of soul with all its consequences. It admits of an interpretation that makes it unnecessary to divide his work into three or more different developmental phases with very divergent positions, a division introduced by W. Jaeger in 1923.⁶ It can give a meaningful and significant place to the splendid work *On the Cosmos (De Mundo)*⁷ and it defends the authenticity of the treatise

6. W. Jaeger, *Aristoteles. Grundlegung einer Geschichte seiner Entwicklung* (Berlin: Weidmannsche Buchhandlung, 1923; repr. 1955). Eng. version: *Aristotle. Fundamentals of the History of his Development*, transl. with the author's corrections and additions by R. Robinson (Oxford: Oxford University Press, 1934; 2nd ed. 1948; repr. 1962). Cf. A. P. Bos, "Development' in the Study of Aristotle" (Amsterdam, Free University, 2006); id., *The Soul and Its Instrumental Body. A Reinterpretation of Aristotle's Philosophy of Living Nature* (Leiden: Brill, 2003), 13–30. See also K. Oehler, "Der Entwicklungsgedanke als Heuristisches Prinzip der Philosophiehistorie," *Zeitschrift für Philosophische Forschung* 17 (1963): 606–15; repr. in id., *Antike Philosophie und Byzantinisches Mittelalter. Aufsätze zur Geschichte des Griechischen Denkens* (München: C. H. Beck, 1969), 38–47; W. C. Calder III, ed., *Werner Jaeger Reconsidered* (Atlanta: Scholars Press, 1992). M. Rashed, *L'Héritage Aristotélicien. Textes Inédites de l'Antiquité* (Paris: Les Belles Lettres, 2007), 9 expressed his criticism of W. Jaeger, F. Nuyens, J. Dumoulin nicely: "La génétique, en se focalisant sur la pierre, manque la cathédrale."

7. See G. Reale and A. P. Bos, *Il Trattato Sul Cosmo per Alessandro Attribuito ad Aristotele. Monografia Introduttiva, Testo Greco con Traduzione a Fronte, Commentario, Bibliografia Ragionata e Indici* (Milano: Vita e Pensiero, 1995); and A. P. Bos, *Aristoteles, Over de Kosmos. Ingeleid, Vertaald en van Verklarende Aantekeningen voorzien* (Meppel: Boom, 1989). Against their view: P. Moraux, *Der Aristotelismus bei den Griechen von Andronikos bis Alexander von Aphrodisias*, vol. 2 (Berlin: W. de Gruyter, 1984), 5–82; J. C. Thom, ed., *Cosmic Order and Divine Power. Pseudo-Aristotle, On the Cosmos. Introduction, Text, Translation, and Interpretive Essays* (Tübingen: Mohr Siebeck, 2014). Cf. my review in *Acta Classica* 58 (2015): 232–37. Arguments against Aristotle's authorship are often based on the traditional title of the treatise, differences from the *Meteorologica*, the references to Homer as "the Poet" and the use of the term *aiôn*. Support for the work's authenticity could be drawn from the designation of Alexander, to whom the work is dedicated, as *hègemôn*, the order in which the names of the planets are listed, the subtle references to *Iliad* 8, which is also cited in *Motu anim.*, the links with Thales of Miletus and *Gener. anim.* III 11, and the fact that the name of the city of Persepolis is not mentioned. These matters are mainly treated in chapter 9 below. The line of argumentation pursued in this book will be: the philosophy presented in *On the Cosmos* does not fit with any date proposed for the work's genesis. Nobody has plausibly explained how the work could have been written by anyone other than Aristotle. On the other hand, the theology of God as the "Begetter" of all living entities in the cosmos and the *pneuma* doctrine, as well as the citation of an Orphic line in 7, 401b2 on Zeus as male and female, fit remarkably well with Aristotle's view of how living creatures are generated. In the time after Aristotle's death his biological insights were seriously neglected.

*On the Life-Bearing Spirit (De Spiritu)*⁸ as a work in which Aristotle treats a subject that he had to treat in any case because he had adopted an entirely new position on its central subject.

This view does more justice to Aristotle's insight that the beginning of a new living being is situated at the moment of fertilization, and not at the moment of birth. Aristotle therefore had to explain how the soul can be present at this point and how, through its instrumental body, the soul is able to produce the visible body with all its different parts (the heart being the first) as an individual exemplar of an intelligible species. This view also allows us to understand how Aristotle could talk about a great "Plan" or "Design" for the cosmos and could relate this to the divine Intellect, and how he could comprehend and present all vital phenomena in a teleological perspective.

My view is an alternative to the interpretation of Aristotle's psychology by Alexander of Aphrodisias, who left no room for a doctrine of *pneuma* in Aristotle's philosophy of living nature.⁹ The ready acceptance of the standpoint put forward by Alexander of Aphrodisias fostered an image of Aristotle's philosophy in which *On the Cosmos* and *De Spiritu* could no longer be accommodated and his dialogues, too, were dismissed as irrelevant.

8. Aristotle was alone in having a *philosophical need* to write about the status of *pneuma*, on account of the fact that he had come to reject Plato's doctrine of breath as the dominant process in a living being, after reaching the insight that life does not begin at the moment of birth but at the moment of fertilization. This puts paid to the idea that an immaterial soul enters the body of a new living creature at birth and at the beginning of the process of respiration. He therefore concluded that the semen of animals and the seeds of fruits already contain the soul and its instrumental, pneumatic body (*Anim.* II 1, 412b25–7). The same view is defended by Aristotle in his *De Respiratione* and *Gener. anim.* In *De Motu Animalium* 10, 703a10, Aristotle himself also seems to indicate that he wrote a contribution on the very theme of *De Spiritu*. There was no longer much reason for such an argumentation fifty years after Aristotle's death. It is therefore unfortunate that the work was rejected as nongenuine by W. Jaeger, "Das *Pneuma* im Lykeion," *Hermes* 48 (1913): 29–74; repr. in *Scripta Minora* (Roma: Edizioni di Storia e Letteratura, 1960), 57–102. On his authority, it was long disregarded. See thereafter A. Roselli, [*Aristotele*] *De Spiritu* (Pisa: Ets. Editrice, 1992); P. Macfarlane, *A Philosophical Commentary on Aristotle's De Spiritu* (PhD thesis Duquesne University, 2007); A. P. Bos and R. Ferwerda, "Aristotle's *De Spiritu* as a Critique of the Doctrine of *Pneuma* in Plato and his Predecessors," *Mnemosyne* 60 (2007): 565–88 and Aristotle, *On the Life-Bearing Spirit (De Spiritu). A Discussion with Plato and his Predecessors on Pneuma as the Instrumental Body of the Soul. Introduction, Translation, and Commentary* (Leiden: Brill, 2008) have defended the authenticity of the small work. However, see now P. Gregoric, O. Lewis, M. Kuhar, "The Substance of *De Spiritu*," *Early Science and Medicine* 20 (2015): 101–24; P. Gregoric, O. Lewis, "Pseudo-Aristotelian *De Spiritu*: a New Case against Authenticity," *Classical Philology* 110 (2015): 159–67; O. Lewis, P. Gregoric, "The Context of *De Spiritu*," *Early Science and Medicine* 20 (2015): 125–49. Their contribution emphasizes medical matters dealt with in the work. They date it after 270 BCE because an Aristogenes is mentioned in *Spir.* 2.

9. See especially chapters 12 ff. below.

The results achieved in this work can be summarized in nine points:¹⁰

1. The “instrumental body of the soul” of which Aristotle speaks in his definition of soul is ether in the superlunary sphere and *pneuma* in all that comes into being and passes away.
2. This *pneuma* is an essential component of semen and menstrual fluid.
3. The *pneuma* in semen is the carrier of a power (*dynamis*) that is the actual soul-principle (entelechy).
4. This entelechy is “asleep” when it works in plants and animals, and in human beings until the age of discretion. In human beings the entelechy may be “awakened” and may then itself take on a “guiding” role. For the soul or entelechy is always a “goal-pointing system” (G.P.S.). In its default mode it is always “asleep,” but it “awakens” in a human being who has achieved intellectual liberation. This concept of “double entelechy” is the basis of Aristotle’s teleological view of nature, which many believe he failed to anchor in his philosophical system.
5. Aristotle’s new theory was necessary, because he rejected Plato’s doctrine of the inhalation of the soul at the first breath. According to Aristotle, life starts at the moment of fertilization.
6. This point made it necessary for Aristotle to write the treatise *De Spiritu*, in which he argues that *pneuma* is present before respiration begins, and is therefore not identical with breath.
7. The guiding power inherent in all that lives derives from the Entelechy par excellence, the divine Intellect, and is compared by Aristotle with the power of a magnet. The notion of entelechy/guiding power follows from Aristotle’s strict separation between the “charioteer” and his “two horses” in Plato’s image of “the soul.”
8. The designation of God as “Begetter” (γενέτωρ) and of his Power as the all-structuring and all-ordering Principle, as found in *On the Cosmos*, cannot have been defended by anyone other than the author of *Generation of Animals*.

10. For a fuller survey, cf. ch. 19 below.

9. Radically new interpretations of the following texts are proposed:

<i>On the Soul</i>	I 4, 408b14–5	(§ 10d)
	II 1, 412a22–6	(§ 10q)
	412b1–4	(§ 13)
	412b4–6	(§ 14)
	412b17–3a5	(§ 5; § 10e)
	413a8–9	(§ 10q)
	4, 415b7	(§ 3a; § 6)
<i>De Caelo</i>	III 9, 433a4–6	(§ 10q)
	I 1, 268a9–b10	(§ 3c)
<i>Physics</i>	VIII 2, 253a11–2	(§ 5d)
	6, 259b16–8	(§ 5e)
<i>On the Cosmos</i>	1, 391b5–8	(§ 9; § 9h)
<i>On Sleep</i>	1, 454a8–10	(§ 10e)