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The Third Part of The Studies on *Arche*: The Principle of Law*

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Abstract
In Ancient Greece, apart from skeptics and ethicists, practicing philosophy essentially meant engaging science, particularly physics and cosmology. The primary goal of this philosophy-science was to explain nature through three fundamental principles, which Aristotle identified as the material cause, the efficient cause, and the formal cause. Aristotle argued that these principles had been inadequately addressed by his predecessors, with the formal cause often overlooked. While Plato developed all three principles in *Timaeus*, Aristotle complicated the history of the studies on *arche* by ignoring *Timaeus* and claiming that Plato was not a physicist. This article focuses on the evolution of the third principle -the formal cause- within this framework, tracing its evolution from Thales to Plato.

Keywords: *Arche*, Formal Cause, Ideas, *Timaeus*.

***Arke* Araştırmasının Üçüncü Kısmı: Yasa İlkesi**

Öz
Kuşkucuları ve ahlakçıları hariç tutarsak Antik Yunan'da felsefe yapmak, bilim yapmak anlamına geliyordu. Felsefe-bilim ise doğayı üç ilke açısından incelemekten ibaretti. Aristoteles bunlara maddi neden, fail neden ve biçimsel neden adını vermişti. Ona göre kendisinden önce bu ilkeler yeterli şekilde incelenmemişti, hatta biçimsel neden tümüyle ihmal edilmişti. Öte yandan Platon bu üç ilkenin tamamını *Timaeus* eserinde eksiksiz şekilde işlemiş olmasına rağmen, Aristoteles *Timaios'u* görmezden gelip Platon'un bir fizikçi olmadığını söyleyerek *arke* araştırmasın tarihini karmaşık hale getirdi. Bu makale maddi neden ve fail nedenlerden sonraki üçüncü ilkenin, Tales'ten Platon'a kadar olan gelişimini konu almaktadır.

Anahtar Kelimeler: *Arke*, Biçimsel Neden, İdealar, *Timaios*.

Introduction

Our understanding of the studies on arche is largely shaped by Aristotle's review of the Presocratic philosophers in the first book of his *Metaphysics*. The first thing we notice, when analyzing the entirety of this project's history

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independently of Aristotle, is that it was not limited to the Presocratics. Contrary to his belief[1], Plato and other later Platonists also engaged with the concept. According to Aristotle: (a) Most philosophers thought that the principles, which constitute the nature of a material object A, are preserved, and do not change while they emerge as another B.[2] The transition between A and B corresponds to an alteration of the states of the substratum.[3] (b) Those who present the material cause as one in number couldn't realize that there must be a principle of movement besides the nature of the things.[4] Conversely acknowledging that the material cause can be more than one makes it easier to recognize the need for a moving principle.[5] (c) None of the philosophers focused on the formal cause, except of the Pythagoreans and the Platonists, who put forward the numbers and the ideas as essences of the things.[6]

We can confidently assert that these findings regarding the history of the studies on *arche* are incorrect. (a1) Philosophers who believe that the Constituent Principle (TCP) -or, as seen in Aristotle's philosophy, the material cause- changes as it generates different objects are almost in the majority to those who regarded it as unchanging, uncreated and indestructible. Three positions can be built around change: First, TCP transitions from existence to non-existence (death), while different objects emerge from non-existence (birth). Second, TCP serves as an unchanging substratum, with different objects representing alterations in its states. Third, TCP remains an unchanging substratum, but the objects are nothing more than appearances and thus they luck real exist. Aristotle sees the

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[1] Aristotle, *Metaphysics (The Complete Works of Aristotle)*, 987a29-987b13, 988a8-17. According to him, Plato was influenced by the idea that it is impossible to conduct research or science on material thing because they constantly changing. For this reason, Plato was known for focusing on the real entities instead of their material imitations. On the other hand, there is no doubt that Aristotle interpreted the principles of ideas (the One and the Dyad) from Plato's *Unwritten Theory* as formal and material causes. However, the fact that the One and the Dyad are regarded as "arche" doesn't imply that Plato actively participated in the investigation of arche. There is an unconscious inclusion in Aristotle's system of four causes, rather than active research. If Plato had actually investigated the material objects, he would have to say that there must a principle that moves them, but he didn't. Again, the reason why some of the physicists couldn't find The Moving Principle is explained by their system's looseness and incompleteness.

[2] Aristotle, *Metaphysics*, 983b6-18.

[3] When Socrates learns music, he is in state A, but if he forgets it, he will go to state B.

[4] Aristotle, *Metaphysics*, 984a17-984b22.

[5] Aristotle, *Metaphysics*, 984b5-985a12.

[6] Aristotle, *Metaphysics*, 986a14-22, 986a33-986b5.

second option as necessary for generation and destruction not to occur in nature, and he believes that most of the philosophers adopt this position. However, it is only Thales and Anaximenes who seem to fit Aristotle's description.[7] The philosophers before Parmenides such as Anaximander, Philolaus and Heraclitus do not see any objection in TCP dying or borning[8], and the philosophers after him such as Empedocles, Anaxagoras, Leucippus and Democritus built their Constituent Principles on the third option.[9] (b1) In his *Metaphysics* Aristotle thought that The Moving Principle (TMP) would be possible only when the number of TCPs was greater than one and they were opposed/unlike, in other words, that the motion would arise only from the relationship of opposing/unlike forces. In *Physics*, he immediately overhauls this view and says that those who make TCP one in number describe it as self-mover.[10] This is true about Anaximenes, Anaximander and Heraclitus[11], but it neglects the gods and souls that move Thales' water, which we understand to be at rest.[12] (c1) If the third principle must necessarily be "essences", no one has expressed it except Platonists and Aristotle. But considering that Aristotle complains about the abstractness of Platonic essences, we realize that no one has fully grasped true Aristotelian philosophy except Aristotle himself. This article aims to show that this third principle was the third foundation for physics and cosmologies before Aristotle and that, contrary to his claim, there was no exception among the natural philosophers who did not develop this principle. We expanded upon the analysis of Plato's works because of the well-established conviction that

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[7] Thales, Anaximander, and Anaximenes, *Beginnings and Early Ionian Thinkers (Early Greek Philosophy I)*, D4(233), D31(363).

[8] Thales, Anaximander, and Anaximenes, D4(233), D6(283), D7(285), D8(289), D10(291), D31(363); Xenophanes and Heraclitus, *Beginnings and Early Ionian Thinkers Part 2*, D52, D54, D86, D87. According to Heraclitus and Anaximander everything begins (borns) from fire and apeiron and ends (dies) into them. Unlike in Aristotle's example where Socrates and his state "musical" can coexist simultaneously, in these philosophers TCP and its alterations do not coexist but exist sequentially. They also use the notions such as "the birth, the death, the destruction and the unlimited revolve" to directly evoke this meaning. Again, according to Philolaus, TCPs (the limiting and the unlimited things) preexist. If material objects did not exist after TCPs, human knowledge would not be possible.

[9] Empedocles, *Empedocles: The Extant Fragments*, 8(17), 9(12), 12(8), 13(9), 15(23), 16(26), 7(6); Anaxagoras, *Anaxagoras of Clazomenae Fragments and Testimonia*, B1, B3, B4, B8, B10; Leucippus and Democritus, *Later Ioanian and Athenian Thinkers Part 2*, D13, D14, D23. According to Empedocles, Anaxagoras, Leucippus and Democritus the way not to call things (other than elements, particles and atoms) exist is to multiply the number of TCPs and mix them together to produce images that we call "objects". Empedocles also uses the names of gods to refer to the four elements, because gods are not born and do not die.

[10] Aristotle, *Physics (The Complete Works of Aristotle)*, 184b15-22.

[11] Thales, Anaximander, and Anaximenes, *Fr.*, D7.2(285), D8(289), D9(291), D3.2(241), D5(345), D6(345); Xenophanes and Heraclitus, *Fr.*, D82, D90.

[12] Thales, Anaximander, and Anaximenes, *Fr.*, D10, D11, R34, R35.

Plato was not a physicist, a conviction that had persisted since Aristotle, and because of the significant innovations his *physicist* teacher brought to the third principle. Since we wanted to limit ourselves to Plato's dialogues, we did not include his *Unwritten Theory* to this research.

1. Academic Studies on the Subject

The interpretations of the Presocratics can be divided into two categories: There is no doubt that the first and most decisive commentary came from Aristotle, who was also a historian of philosophy. It is reasonable to assert that all subsequent interpretations were influenced by Aristotle's perspective. His theory of the Four Causes became so popular that earlier philosophers were viewed as incomplete precursors of his framework.

Among contemporary researchers, Özgür Aktok appears to be the only to suggest that Heraclitus may have conceived of a third principle, alongside the material cause and the cause of motion[13]. Earlier scholars such as John Burnet, Eduard Zeller, and W. K. C. Guthrie, have argued that Aristotle's interpretations can be misleading[14]. However, they did not propose the possibility of a third kind of principle, as discussed in this article. It is noteworthy that Zeller observed, "as to the way in which things arise from water, Thales does not seem to have explained himself further"[15]. Yet, as we shall see later, the emergence of things from the water was governed by the principle of law, which in Thales' system functioned as an abstract rule (see **Table 5**). Thales was the first philosopher to use three principles to explain nature, and the triadic framework was later adopted by others: the material cause and the cause of motion (as Aristotle later termed in), and the principle of law.

Regarding interpretations of Heraclitus, Zeller highlights that the philosopher recognized a universal law in the transience of objects[16]. Burnet, on the other hand, asserts that Heraclitus' logos must be something distinct from his material cause, fire, or even his theory of flux[17]. First, it is important to note that neither of Zeller nor Burnet explicitly claims that Heraclitus effectively employed a principle of a third kind in his philosophical system. Second, contrary to Burnet's rejection of a connection between the logos and

[13] Özgür Aktok, "İlkçağ Doğa Felsefesinde Özdeşlik ve Değişim Problemi: Thales, Anaximandros, Anaximenes ve Herakleitos," 368–383,
[14] Eduard Zeller, *Outlines of the History of Greek Philosophy*, 87; John Burnet, *Greek Philosophy Part 1*, 21; W. K. C. Guthrie, *A History of Greek Philosophy The Earlier Presocratics and the Pythagoreans*, 54.
[15] Zeller, *Outlines of the History of Greek Philosophy*, 54.
[16] Zeller, *Outlines of the History of Greek Philosophy*, 67.
[17] Burnet, *Greek Philosophy Part 1*, 57.

the theory of flux, we will argue that the logos is fundamentally rooted in the theory of flux.

This article argues that the set of three principles used by the Presocratics was also present in Plato's works. However, due to the prevailing opinion that Plato was not a natural philosopher, no interpretation to date has identified a clear pattern of physics in his dialogues. Francis M. Cornford asserts that the model described in *Timaeus* is an ideal living being. According to him, the sensible universe we inhabit is a copy of the intelligible world above[18]. Yet, Cornford maintains that the world above us does not encompass all of Plato's forms. The ideal living being provides a physical form only for physical objects within the sensible world. This implies that as if Cornford is claiming that certain forms -such as moral forms- are absent from the ideal living being. In this study, however, we will argue that the model, the ideal living being, incorporates living versions of the forms presented in Plato's middle dialogues. While Cornford contends that we have no warrant for this assertion, we suggest that the warrant lies in the insufficiency of the forms from the middle dialogues to fully account for physical becoming. This explanatory gap, we argue, was addressed in *Timaeus* by endowing the forms with life, thereby bridging the divide between the intelligible and sensible worlds.

2. Definition

The third part of the studies on arche is The Principle of Law (TPL) which determines *according to what* objects will exist. The "according to" case here indicates when and under what conditions an object will emerge. Initially, TCP itself exists, but there is no particular "that object"; and then *the object* appears. TPL can sometimes also explains how objects will differ from each other. When this happened, TPL is said to be detailed. Accordingly, in a system, an entity in a position A carries the predetermined characteristics of A and its fate is determined according to A; an entity in a position B carries the predetermined characteristics of B and its fate is determined according to B. We call the narrative that gives rise to positions A and B a *law*.

3. Types of The Principle of Law

The first type of laws functions as a "measure", conceptualizing objects on a chart of gradual progression and regression. For Thales *physis* is understood in terms of degrees between solidification and liquification.[19]

[18] Cornford Francis M., *Plato's Cosmology*, 39.
[19] Thales, Anaximander, and Anaximenes, *Fr.*, D4.

The winds, clouds, water, soil, trees, stones, animals etc. all these exist in various degrees of water condensation. Anaximenes extends this reasoning by describing the stages as ranging between densification and rarefaction[20], because air is rarer than liquids.[21] Heraclitus[22] is the first to emphasize that the progression and regression should occur in a cycle[23] (see Shape 1). The phases of this cycle represent the measures (το μετρον)[24] of the fire's burning and extinguishing. Since nothing can escape the cycle, it is the fate (ἡ βουλη)[25] of things to transform from one state to another according to *the law* (ὸ νομος) *of change*[26]*,* which itself remains constant. And to be aware of this law is to possess the only true knowledge (ὸ λογος).[27] As a Pythagorean, Philolaus formalized the law as an object of science by assigning numbers to these measures of change. Accordingly, everything is dependent on numbers in quantity and size, meaning that each thing exists according to its specific number:[28]

- Things come into *existence* when limits are added to the limitless (το απειρον).[29]
- When limits are imposed, sciences emerge, and things become *ready to be known*, because limited multitude is called quantity and limited magnitude is called size. Quantity and size form the domains of arithmetic and geometry.[30]
- Therefore, the "existence" of a thing and its "readiness to be known" occur simultaneously.
- We know that arithmetic and geometry deal with "things that have numbers". That is when things acquire numbers, they become knowable through the sciences.
- Consequently, everything that exists has a number.

[20] Thales, Anaximander, and Anaximenes, D1, D2, D7, D8, D18, D21, D25, R15.
[21] Thales, Anaximander, and Anaximenes, D4.
[22] Aktok, "İlkçağ Doğa Felsefesinde Özdeşlik ve Değişim Problemi: Thales, Anaximandros, Anaximenes ve Herakleitos." Özgür Aktok had identified that Heraclitus' logos was a second principle different from the Constituent Principle, i.e. fire.
[23] Xenophanes and Heraclitus, *Fr.*, D54, D51, D86, D87, D96.
[24] Xenophanes and Heraclitus, D85; Yakup Akyüz, "Sokrates Öncesi (Presokratikler) Doğa Felsefesi," 55–92.
[25] Xenophanes and Heraclitus, *Fr.*, D45, D108; Heraclitus, *The Fragments of The Work of Heraclitus of Ephesus on Nature*, paras. 65, 110. It was George Thomas White Patrick who linked Heraclitus' 45th fragment with the 108th.
[26] Xenophanes and Heraclitus, *Fr.*, D105, D106.
[27] Xenophanes and Heraclitus, D1.
[28] Philalous, *Philolaus of Croton Pythagorean and Presocratic A Commentary on the Fragments and Testimonia with Interpretive Essays*, paras. 4, 5.
[29] Philalous, para. 2.
[30] Philalous, paras. 3, 6.

The second type of laws basically offers two kinds of "mixtures". The concept of mixtures is a defining characteristic of *the physics of elements*, which began to take shape following Parmenides' critiques. Unlike *the physics of metamorphosis* -where fundamental components (TCPs) like water, air, fire, earth, apeiron and limits undergo change- in the physics of elements, TCPs do not alter; they remain stable while forming objects. Since each element (such as earth, water, air, fire or a homogeneous part) is itself an object, in order for them to create new objects while they remain stable, they had to be more than one in number and enter into compounds.

The appearances of these mixtures as distinct objects are based on the differences in the ratio of their components. Thus, there are three possible combinations for the elements: They may exist in equal proportions within a mixture, remain isolated in their pure state without interacting with others, or form infinite number of mixtures with differing proportions of elements. Since a mixture with elements in equal proportions is by definition a unified entity, it is positioned at the origin of the universe. According to Empedocles and Anaxagoras all the elements first exist in a "sphere"[31] or "whole"[32] (συμπας) -states of unity and *neutral mixtures* in which no single element dominates and no attribute is distinct. This unity is followed by a chaos, as a result of the transition from the complete dominance of Empedocles' Love to the complete dominance of Strife[33] or the motion initiated by Anaxagoras' Nous, rotating in a vortex.[34] Since the Sphere and the Whole represent neutral mixtures and the Chaos signifies a state of infinite dissociation among the elements, objects only begin to emerge where Love and Strife have relative and sequential dominances[35] in vacuum[36] and when smaller group formations begin to appear in the vortex. Thus, the law here *dictates* the transition from the neutral mixture to those with unequal elements.

The third type of laws are "essences" or "ideas", just as Aristotle always wanted it to be. Plato gives us an analogy, in the sixth book of *Politeia*, with a divided line, comparing the upper universe and the lower universe in terms of existence and knowledge.[37] Accordingly, just as shadows are imperfect

[31] Empedocles, *Fr.*, para. 21(27), 22(29/28); Empedocles, Parmenides, and Zeno, *Western Greek Thinkers Part 2 (Early Greek Philosophy V)*, D98.
[32] Anaxagoras, *Fr.*, paras. B1, B4a, B4b.
[33] Empedocles, *Fr.*, para. 23(30), 24(31).
[34] Anaxagoras, *Fr.*, paras. B9, B12.
[35] Empedocles, *Fr.*, para. 8(17), 15(23), 16(26).
[36] Empedocles, para. 21(27), 22(29/28). Stillness means to be surround by emptiness.
[37] Plato, *Republic (Plato Complete Works)*, 509d–513e.

copies of material objects and derive their qualities from them, the entire sensible universe is an imperfect copy of an intelligible universe and derives its qualities from it. There are two fundamental qualities that distinguish a copy from an original. First: Copies must have beginnings in time (they are occurrent beings). This is quite obvious, as copies are *dependent* on originals for their existence. Second, the beings in the upper universe are considered the originals of dependent-occurring beings because they *do not change*. Since ideas are unchanging, it follows that they are *the real beings*.

Plato's philosophy of ideas evolved throughout his works, and consequently, the real beings, i.e. TPL, had different appearances. In *Politeia*, they consist of "concepts" such as the Beautiful and the Good[38], and "mathematical objects" such as shapes and numbers.[39] It should be noted that interpreting *Politeia* as an attempt by Plato to engage in physics or to participate in the inquiries into *arche* would be misreading of the dialogue. Plato explicitly defined physics and placed it on the second-lowest step of the divided line, stating that it provides only beliefs rather than knowledge. However, even though Plato insisted on not engaging physics, he inevitably identified a physical principle, a principle of law: material objects exist *according* to the ideas.

The fourth type of laws explains physis through a change of "medium", specifically from a non-physical medium to a physical one. According to Anaximander, objects exist by transitioning from the inside of the Apeiron (non-existence) to outside of it (existence), before eventually returning to non-existence. He conceptualizes the interior of the Apeiron as the medium of justice, and its exterior as injustice.[40] It is called justice because, in non-existence, all things wait equally, with none violating the equality by coming into existence. Those that are born must complete the cycle by returning (dying) to non-existence, thereby maintaining sequential existence, and paying a penalty to the unborn. Anaximander dramatizes this necessary nature of physical change with the notion that "justice will be done!".

While it is uncertain whether the concept of equality introduced by Anaximander has a direct connection to proportional equality in Empedocles' Sphere or Anaxagoras' Whole, it is clear that there is a similarity between the two concepts. The Sphere, in particular, stands out among

[38] Plato, *Republic*, 507b.
[39] Plato, *Republic*, 510c.
[40] Thales, Anaximander, and Anaximenes, *Fr.*, para. D6.

geometric shapes for its mathematical representation of equality[41] in Greek thought.

As for Anaximander's idea of necessity, built around the concept of justice, later influenced TPLs of Leucippus and Democritus. Since the atomists did not incorporate a god, i.e. a TMP, into their system to disrupt the initial unity of the universe and trigger chaos, they proposed that everything originated directly from an initial chaos. Unlike the concepts like the Strife or Nous, which act with intent when throwing things around, the atomists envisioned chaos as a medium of chance.[42] The movements of atoms are unpredictable, but once atoms start to collide, it is necessarily determined which compound will form on which atoms interact. From the moment atoms begin to collide, the medium of necessity[43] comes into play.

Plato presents different kinds of TPLs in his *Timaeus*, some of which fall into this fourth category. Since he treats physics as a form of craftmanship, he introduces two types of performers (TMPs) and three types of outputs depending on the performer's ability (see Table 1). The first TMP, in the chronological order of the universe, is characterized as Evil (disordered and unable to put in order), Unwise (unconscious) and Unseeing (cannot look at any model).[44] This nameless moving principle simultaneously functions as a TCP, acting as the raw material upon which all processes of becoming take place.[45] When it generates things, it does so from within itself. However, since it is -Unseeing- not aware of any models, it cannot construct the sensible universe. Instead, it builds the four elements for the first time. Yet, because of its coincidental -Unwise- movements, these outputs are inherently -Evil- defective.[46] Plato refers to this coincidental stage as *the medium of necessity.*[47] While this may seem surprising, Plato implies that in the absence of conscious and rational action, coincidence and necessity are indistinguishable (see the atomists' distinction between the mediums of chance and necessity above).

The fifth and final type of laws concerns "models", which Plato introduces in his late dialogues, especially in *Timaeus*. These models replace the

[41] Empedocles, *Fr.*, para. 22(29/28); Plato, *Timaeus (Plato Complete Works)*, 33b. "Every point on the circle/sphere is the same distance from the center."
[42] Leucippus and Democritus, *Fr.*, paras. D58, D76, R79b.
[43] Leucippus and Democritus, paras. D73, D74, D75, D76a.
[44] Plato, *Timaeus*, 52e–53d. It is filled with irregular and irrational powers.
[45] Plato, *Timaeus*, 50d, 52d.
[46] Plato, *Timaeus*, 53b.
[47] Plato, *Timaeus*, 48a, 53d.

concepts and shapes of the *Republic*. Like concepts and shapes, models are real beings because they do not suffer change. However, unlike their predecessors, the models are alive.[48] To fully understand these models, we must first consider the second type of TMPs described in *Timaeus:* The Demiurge and his sons. These TMPs are characterized as Good (they able to organize and put in order), Wise (conscious) and Seeing (they look at models).

Initially, the Demiurge overcame the struggle[49] against the first TMP, which was also a raw material, and crafted regular -Good- geometrical shapes out from it, i.e. the triangles.[50] He then combined these triangles to produce the four perfect, defect-free elements.[51] In this case, the four elements initially created by the first TMP can be seen as *prototypes* , whereas the elements produced by the Demiurge are their perfected versions. Finally, modeling -Seeing- the universe above, the Demiurge created the shell of the universe below[52]: the sphere of fixed stars, the race of gods made of fire.[53] Here the triangles and the four elements created from them, and the shell constructed from the element of fire, are seen to be the second type of outputs in the *Timaeus*, as defect-free and permanent beings.

There is a clear distinction between the defectiveness of an object and its impermanence. The greater the skill of the craft performer, the more permanent the shape they produce. However, the defectiveness arises only when the performer fails to look at a model. This brings us to the less capable artists described in *Timaeus:* the race of gods. These beings, the sons of Demiurge, are also Good, Wise and Seeing. Their task is to use air, water and earth to construct the missing parts of the sensible universe.[54] Since plants, animals, humans and inanimate objects are crafted by these less competent artists (compared to the Demiurge) their creation lack permanence. Nonetheless, both the Demiurge and the race of gods differ from the first TMP, which was also a TCP, in one crucial way: they consciously -Wisely- look to models as they create.

[48] Plato, *Timaeus*, 30c.
[49] Plato, *Timaeus*, 48a.
[50] Plato, *Timaeus*, 53d.
[51] Plato, *Timaeus*, 53b.
[52] Plato, *Timaeus*, 33b.
[53] Plato, *Timaeus*, 40a.
[54] Plato, *Timaeus*, 41b–41d.

	The First Output	**The Second Output**	**The Third Output**
Evil, Unwise, and Unseeing Moving Principle, and the Raw Material of the Sensible Universe	The prototypes of the four elements		
Good, Seeing, and Wise Moving Principle: The Demiurge		The triangles, the four elements, and the spherical shell, i.e., the race of gods	
Good, Seeing, and Wise Moving Principles: The Race of Gods			Plants, animals, humans and inanimate objects

Table 1: Three outputs described in *Timaeus*

4. The Principle of Law as a Being

The greatest contribution that Plato made to the studies on arche was to elevate TPL from the level of abstract categories to the level of existence. No TPL put forward before him had ever been more than mental distinctions:

- Thales and Anaximenes' concepts of the degrees of solidification or densification, along with Heraclitus' measures within the Cycle, represent indicators that cannot be directly observed in the external world but can only be expressed mathematically. When one object is more solid or denser than another, we say that its degree of solidification-densification is higher; however, these degrees themselves *do not have an independent existence.*
- Philolaus' use of numbers, addresses the need to measuring and numbering things, much like the barcodes printed on commercial products today. Even if we accept the existence of numbers on the barcodes, they are ultimately nothing more than signs that help us identify the quantity of matter an object contains.
- Anaximander's concepts of justice and injustice, the Atomists' notions of chance and necessity, and Empedocles' and Anaxagoras'

> ideas of mixtures are mental constructs due to their conceptual nature. Proportions within the mixtures merely describe how objects behave. For instance, we might say "Objects come together to form a sphere, scatter in chaos, or move randomly without colliding". However, while compounds and mixtures themselves are real, their proportions or behaviors are not entities in their own right.

Contrary to tradition, Plato's TPLs are described as truly existing entities. In both the famous Allegory of the Cave (AC) and the Analogy of the Divided Line (ADL) introduced in the *Republic*, these laws are not only depicted as existing, but are also described as being *more real* than the sensible universe itself.[55] Things like Temperance, Courage, Justice, Piety, Triangle, Square, Sphere and Pyramid are concepts that can be perceived by the mind When we add the characteristic of preceding and existing independently of human cognition to these concepts and shapes, we arrive to what is known as *conceptual realism*. However, applying conceptual realism to physics introduces significant challenges, primarily because the notion that concepts or shapes exist outside and independent of the human mind is not easily grasped by our intuitions. Additionally, establishing the connection between physical objects, such as wind, clouds, water, soil, and stone, which we see with our eyes but are said not to exist properly, and their corresponding ideas, such as the concept of Wind, the concept of Cloud, the concept of Water, the concept of Soil, and the concept of Stone, which we cannot see but are very existent poses new difficulties. Plato is known to avoid delving physics in the middle dialogues, which might explain why this issue was not addressed earlier. In *Timaeus*, however, by incorporating Pythagorean principles and turning to physics, he was compelled to reconsider the role of ideas. The innovation is this: by attributing "life" to the concepts and shapes that precede and are independent of human existence, Plato introduces the ideas of *Timaeus*. The notion of "living concepts", which is understood to be a kind of depiction of heaven, has now become compatible with physics through the artist-model duality. This new perspective, in which heavenly beings serve as models, can be termed *holotypic realism*.

We can trace the realistic nature of ideas through dialogues in two stages. In the first stage, as described in the sixth book of *Republic*, Plato places the originals of the geometric shapes that studied by the sciences and the abstract concepts that a philosopher should be oriented towards above the

[55] Ahmet Cevizci, "Platon'un Devlet'teki Bölünmüş Çizgi Analojisi," 31; Plato, *Republic*, 509d.

divided line. According to Plato, scientists and philosophers are the one who can best grasp this intelligible part, which serves as repository of abstract concepts. This is because their access to the intelligible universe is the only way to do science in the sensible universe. Understanding the interplay between the intelligible and the sensible, is key to grasping how sciences function. For ordinary listeners of dialogue like us, however, visualizing this relationship is challenging, as abstract concepts remain beyond our direct experience. So, we can assume that the analogy was written in the apophatic style which appeals only to some audiences. Again, the purpose of the first stage was *to negate the intelligible part of line/universe from the sensible part*.

In the seventh book of *Republic*, Plato introduces the Allegory of the Cave but does not yet transitions to the second stage. Instead, he changes his style to re-engage the audience who may have been alienated by ADL. According to the allegory, the sensible universe can be imagined as shadows cast on the wall of cave, while the intelligible universe, which contains the originals of these shapes correspond to the real objects at the cave's entrance. Unlike the ADL, which uses the style of negation to separate the intelligible from the sensible, the allegory employs a style of likening. Here, a tangible being (e.g., the shadow on the wall) is *likened* to another tangible being (e.g., the object at the cave's door). This approach allows us to visualize the elements of the sensible universe (such as wind, clouds, water, soil and stone) as shadows of corresponding concepts in the intelligible universe. It is important to note, however, Plato does not abandon conceptual realism in the AC. He still does not claim there are literal winds, clouds, water, soil or stones in the sensible universe that cast shadows in the sensible universe. Instead, what exist in the intelligible universe are still the abstract concepts: Wind, Cloud, Water, Soil, Stone, and so on.

This tension between the styles of negation and likening, successively expressed in the *Republic*, gives way to the renunciation of conceptual realism and the emergence of *holotypic realism* in *Phaedo* and *Timaeus*. In these dialogues Plato claims that there is another universe, truly living above the sensible one, which contains the specimens of the objects in our world.[56] In this kind of realism, the ideas such as Justice, Courage, Beauty and Good are no longer mere concepts but have become holotypes. According to the intelligible universe depicted in the *Phaedo*, the ethical behaviors of the

[56] Plato, *Timaeus*, 28a, 28b, 29a, 30c, 30d, 31a; Plato, *Phaedo (Plato Complete Works)*, 109c, 110b, 110c, 111a, 111c.

perfect individuals living in heaven correspond to our idea of Good, their ways of apprehending the truth correspond to our idea of Knowledge, and their other virtues correspond to ideas such as Justice, Love, Courage. As can be seen, the "existence of the upper universe", initially treated as a tangible entity during the stage of likening (despite being nothing more than conceptual) is *affirmed* in the *Phaedo* and *Timaeus*. The result is the assertion of another universe: a living-abstract-intelligible realm that exists above the living-tangible-sensible world.

	Type	**Related Passages**	**Style**	**Aims**
First Stage	Conceptual Realism	The Analogy of the Divided Line in *Republic*	Negation	Concepts are negated from beings in the sensible universe.
Transition Stage		The Allegory of Cave in *Republic*	Likening	The relations of concepts to the beings in the sensible universe are described by likening them to the relations between beings in the sensible universe.
Second Stage	Holotypic Realism	The "Living Thing" in *Phaedo* and *Timaeus*	Affirmation	The existence of the intelligible universe is affirmed just like the sensible universe.

Table 2: The transition from conceptual realism to holotypic realism in Plato's middle and late dialogues

5. Holotypic Realism as Models and Its Consequences

How does holotypic realism work in physics? This kind of realism requires an additional perspective that incorporates craft-like activity. Here, the relationship between the artists, the raw materials and the laws that the

artists must obey introduces new innovations and possibilities for the studies on arche.

The first innovation in *Timaeus* is the introduction of more than one artist or Moving Principle. Similarly, let's recall that in Empedocles' framework, there were multiple TMPs, namely Love and Strife, which functioned simultaneously as equivalent forces. Love and Strife was acting like two opposite poles, dividing the workload of moving and shaping things. In contrast, Plato's TMPs operate within a *hierarchical framework of creation*. If the Demiurge had been the sole artist, the sensible universe would have been replaced by an empty shell devoid of live. This is because the Demiurge's role was limited to the initial formation of the sensible universe's spherical shell. After this stage, the race of gods assumes responsibility for further creation. Just as the Demiurge modeled the intelligible universe to craft the spherical shell, the lesser gods also drew upon the same models to form the living beings withing the sensible universe. Again, according to this plan, in the last stage, the human intellects (acting as the last moving principles after the lesser gods) inherit this creative role. Their models *should be* the holotypic humans, or heavenly people, found in the intelligible universe (see *Phaedo*). Thus, the triad of "the Demiurge, the lesser gods and the individual intellects" emerges as the three key artists responsible for the formation of our world.

Second innovation concerns the skills of the artists. In *Phaedo*, the upper universe is compared to the sensible universe, and it is described as the realm where the real sky, the real light, and the real earth exist - not here, but there.[57] This characterization asserts the upper universe's superiority to the sensible one.[58] However, the reasons for this superiority are not what they might seem:

1. The superiority does not stem from the fact that the raw materials of the sensible universe are material substances, like the four elements or atoms, while the nature of the intelligible universe is something else, something more abstract. A being's superiority or its qualification as a real existence is not determined by the abstractness of its TCP but by its degree of *permanence*.
2. The superiority of the models is not a consequence of its role as temporally "primary" while artwork is "secondary" (existing later). A being created later in time can be just as permanent as its model,

[57] Plato, *Phaedo*, 110a.
[58] Plato, *Phaedo*, 110b.

showing that dependent, occurrent beings can be classified as superior.

3. It is not based on an assumed relationship where models are inherently better than their artworks. A truly omnipotent artist could create an exact replica of the model, in such a case, the copy would carry the same qualities, and could be considered just as superior as the model itself.

The main reason the objects we see around us are not considered real beings is that the details within the sensible universe were not perfectly replicated by various artists other than the Demiurge. As stated clearly in *Timaeus*, the skills of the artists are reflected in their artworks.[59] The shell of the sensible universe, crafted directly by the Demiurge, is indeed perfect, permanent and real - just like its model. If TCPs of the sensible universe, such as the four elements, inherently prevented perfection, permanence, or reality, the Demiurge's creation would never have achieved such qualities. Yet it did. Similarly, the lesser gods, fashioned and cared for by the Demiurge himself, are immortal (permanent). The fact that they are made of fire did not prevent their permanence.[60] In contrast, the details within the sensible universe, which are artworks of the lesser gods, they are doomed to aging, wearing out and decay. Had these details been fashioned by the hands of the Demiurge, the sensible universe would have been entirely immortal.[61]

Third: It concerns the nature of the raw material used by the artist. In *Timaeus*, the Constituent Principle is not a lifeless, motionless ingredient waiting to be shaped - like block of stone sculpture, and clay or wax in pottery. Instead, the pile of triangles, or the place (ἡ χωρα) where becoming occurs, behaves like a living being due to irregular, unbalanced, and uncontrolled powers within it.[62] In this sense, it acts as a "non-artist moving principle" alongside the triad of the Demiurge, the lesser gods and individual intellects. When we examine the activity of the pile of triangles, we see it operates in opposition to the Demiurge's ordering practices. This irregularity poses a challenge to the artists. Yet, the omnipotent Demiurge has the strength to overcome the chaotic forces within the pile of triangles.[63]

[59] Plato, *Timaeus*, 28b.
[60] Plato, *Timaeus*, 41a–41b.
[61] Plato, *Timaeus*, 41c.
[62] Plato, *Timaeus*, 48a.
[63] Plato, *Timaeus*, 48a.

However, the lesser gods -being made of fire and therefore belonging to the pile of triangles- lack the ability to fully overcome its instability.

Thus, the dialogue revolves around the struggle between the Necessity of the raw material and Intellect of Demiurge, with Intellect ultimately prevailing over the Necessity. In the case of humans, since their bodies originate from the pile of triangles, they are subject to necessity.[64] However, the Intellect within their souls comes from the Demiurge.[65] The trouble with human beings, then, is not a lack of power (as is the case with the lesser gods) but a lack of will. Each time reason is exercised, virtues and values, akin to the behavior of the people in the upper universe, will emerge.[66] Conversely, yielding to the pressures of the non-artist moving principle -the chaotic source of our bodies- leads to immorality, evil and ignorance within the sensible universe. At this point, human beings bear full responsibility; as during their creation, they were shown the universal laws and models they were required to obey.[67]

Fourth: It concerns the scope of the artworks. Contrary to what one might think, the entirety of the sensible universe, with all its details, did not emerge as a resemblance to the model. This earlier view stems from Plato's idea that "every being has a form from which it derives its qualities". However, the revised perspective in *Timaeus* asserts that "*some* beings have forms from which they derive their qualities". To understand this distinction, we need to compare the contents of the sensible universe with those of the intelligible universe one by one.

1. First, the shell of the sensible universe and the bodies of the living beings within it are also present in the intelligible universe. These entities were fashioned by using the model as a reference, i.e. by partaking the ideas.
2. In contrast, the "negative beings" of the sensible universe -such as feces, mud, thorns, eroded rocks- do not exist in the upper universe. However, the absence of these entities in the upper universe does not disqualify them as artworks in the lower universe. Their existence is attributed to the lesser gods' inadequacy when compared to the Demiurge.
    a. Feces: This aroses with the digestive systems of mortal creatures in the sensible universe. Its mortality is due to its

[64] Plato, *Timaeus*, 42a.
[65] Plato, *Timaeus*, 41c.
[66] Plato, *Timaeus*, 42b.
[67] Plato, *Timaeus*, 42d.

insufficient resemblance to immortal beings of the upper universe.

b. Mud: This results from the inability to completely isolate earth and water -presumably found in pure form in the upper universe- from one another other in the sensible universe.

c. Thorn: These caused flowers, which possess perfect beauty in the upper universe, to manifest as imperfect beauties in the sensible universe. This phenomenon is elaborated in Plato's middle dialogues through the concept of "deprivation". According to this view, the deprivation of ideas to varying degrees accounts for beings that deviate from the perfection of the ideas themselves. For example, whenever the goal of the idea of Beauty is not fully realized, less beautiful forms must inevitably emerge.

3. However, the concept of deprivation cannot explain the "contrast with the ideas". Immoral practices such as ignorance, cowardice, dishonesty, malevolence and injustice -absent in the upper universe, contrary to its model- couldn't have arisen as a product of artistic performance. Art is a process in which a moving principle, acting as an artist, constructs a work by turning toward a model. In this context, we know that ignorance, cowardice and dishonesty are absent in the model. When we examine the artist, no deficiency in ability can result in the creation of something directly opposite to the goal of art. Take the idea of "Politeness" as an example. Misapplications of this idea may lead, on one hand, to excess, such as what we call in Turkish *the Fool of Politeness* -an effort to be overly polite, resulting in looking foolish- and, on the other hand, to deficiency, such as *Social Interaction Disorder*, seen in people with autism or social impaired perception. Similarly, the idea of "Generosity", can, when misapplied, result in excess, such as *Lavishness*, or deficiency, such as *Stinginess*. However, efforts to embody politeness should never result in opposite, Rudeness, just as efforts to embody generosity should never result in opposite, Stinginess.

The scope of artwork includes good, beautiful, and just things, as well as their imperfect derivatives. Beings contrary to the model, arise from a non-artist moving principle within the human component. Indeed, the capacity of the pile of triangle to produce is not denied in *Timaeus*; on the contrary, the

prototypes of the four elements already existed before the Demiurge began shaping the triangles.

Artwork	**Artist**	**Is the artwork resembling the model?**	**Characteristic of Artwork**	**The Reason**
The spherical shell of the sensible universe	The Demiurge	The spherical shell of the intelligible universe	Permanent	The artist is omnipotent
Bodies of living beings within the sensible universe	The Lesser Gods	Bodies of living beings within the intelligible universe	Mortal	The artists are not perfect
Objects like feces, mud and thorn within the sensible universe		No resemblance	Mortal and Negative	The artists are not perfect
People's behaviors that represent knowledge, courage, goodness and justice	The Individual Intellects	Yes, it resembles	Positive	The moving principles chose to act as artist and obeyed the laws
People's behaviors that represent cowardness, barbarism and greed		No resemblance	Contrary	The art was not performed, or the artists chose the wrong model

Table 3: The emergence of the sensible universe in the context of the discourse of "art" described in *Timaeus*

Fifth: It is about the nature of the model. The capacity of an artist to choose between potential models is the underlying reason for differentiation between the artworks. At this point, humans need to be analyzed separately from the lesser gods, as humans possess willpower. At the very beginning of the cosmological passages of *Timaeus*, a connection is established between the artist's will and the nature of the model.[68] Accordingly, the *model* represents the object the artist turns to. If the artist turns towards something permanent, he will produce something permanent, insofar as his abilities allow. However, if he turns towards something mortal, it becomes inevitable that his creation will lack permanence. The possibility of selecting models from defective or imperfect things prompts a reevaluation of Plato's early and middle dialogues, which portray models as flawless, perfect and eternal. This issue is examined under the title "Are there any models for evil or bad things?" in philosophical literature.[69] In fact, Plato himself was aware of this problem.

Let's now examine three relevant passages. In *Parmenides* 130c, the young Socrates, depicted in line with the middle dialogues, argues that not every being in the sensible universe should correspond to a positive model in the intelligible universe.[70] For example, we should not say that there are forms for negative beings such as hair, mud and feces. However, in *Phaedo* 110a, as Socrates approaches death, he emphasizes that the key distinction between the sensible and intelligible universes lies in permanence.[71] Accordingly, negative beings like mud or eroded rocks are considered imperfect copies of the models within the upper universe. These entities have emerged with a certain degree of deprivation of ideas. If we consider that the imperfect replicas are the derivatives of the perfect models, we will have to admit that hair, mud and feces must have had their ideas. Notice, here, that there is still no explanation for the bad things within the sensible universe. It seems that as long as Socrates speaks, there will be no real cosmology, because a system that focuses only on explaining the positive or imperfect things, but cannot explain the bad things, will only be an incomplete cosmology.

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[68] Plato, *Timaeus*, 28b.
[69] Necip Fikri Alican, "The Good, The Bad and The Ugly Does Plato Make Room for Negative Forms in His Ontology?."
[70] Plato, *Parmenides (Plato Complete Works)*, 130c.
[71] Plato, *Phaedo*, 110a.

Finally, in *Timaeus*, we encounter a silent Socrates – a clear indication of the end of a particular philosophy centered on ideas. This shift also signals a renunciation of the earlier reluctance to engage with physics and replaced by a foreign speaker who introduces an artistic conception of physics that incorporates "evil forms". Here, the theme moves beyond the "deprivation of a model" to allow space for "bad models". The artist may turn towards the good things as well as the bad things. This thematic shift is plausible, as the moralistic framework of the middle dialogues, which could suffice only with positive ideas, struggled to account for defects or evils in the cosmological structure. Consequently, the traditional list of ideas prepared according to Justice, Courage, Beauty, the Good and other positive things must now expand to include these new, negative ideas.

	View	**Related Passages**	**Explanation**
First Stage	Negative things do not have any models	The dialogues of the middle period, and *Parmenides* 130c	Beings within the lower universe are not real entities.
Second Stage	All the material objects have their models	*Phaedo* 110a	Negative objects such as hair, mud, feces, thorn and eroded rocks also have models, because they are imperfect replicas of the perfect models.
Third Stage	Everything can be a model	The discourse on "art" in *Timaeus* 28b, and the concepts of "people being introduced to the laws" in *Timaeus* 42d	The model is the holotype that the artist refers to when creation their artwork.

Table 4: Are there any bad ideas according to Plato's dialogues?

This thematic shift in *Timaeus*, which highlights the importance of model choice, also makes meaningful the comparison between Atlantis and Athens presented at the very beginning of the dialogue – a narrative that might initially seem disconnected from the cosmological descriptions that follow. According to the story, in the dawn of the human history different regions of dominance were distributed among communities, each under the care of a

specific gods. However, this balance was disrupted when the people of Atlantis, under Poseidon's care[72], became unruled and engaged in senseless wars.[73] The only power that capable of opposing them was the Athenian people, guided by Athena and Hephaestus[74], who embodied wisdom and virtue. Despite their technological advancement and economic superiority, the barbaric Atlanteans were ultimately defeated by the Athenians.[75] The reason for the Atlantis' downfall, as the story explains, lies in weakening the divine element within them -the intellectual essence bestowed by the Demiurge- while their the human nature, bearing the chaotic characteristics of the pile of triangles, gained dominance.[76] Plato invites us here to choose between two contrasting sets of models: wisdom and virtue as positive models and barbarism and greed as negative models.[77] These are the lessons derived from the story:

1. The people of Atlantis stand before us as candidates for *bad or evil holotypes*. For the first time in history, they have established a way of life that was not only incompatible with wisdom and justice, but directly opposed to these ideals. Thus, they represent the holotypes of their kind in terms of ambitious and greed societies.
2. In contrast, the Athenian people are not themselves holotypes. Rather, Hephaestus and Athena guided them by emulating the perfect models in the intelligible universe, which serve as holotypes for both them and us.
3. The people of Atlantis, who arose within time and ultimately vanished due to natural disasters, demonstrate that impermanent beings can also manifest as holotypes.

In conclusion, [1] a being in the lower realm, such as the shell of the sensible universe, is perfect and permanent only if its holotype in the corresponding category, the shell of the intelligible universe, is perfect, and the associated moving principle -the Demiurge- is omnipotent. Any deviation from this ideal scenario results in defective or evil beings. [2] In this context, the power of TMP can be equivalent to the irregular and irrational activities of TCP -such as when lesser gods and individual intellects act upon the Good-

[72] Plato, *Critias*, 113c.
[73] Plato, *Timaeus*, 25a.
[74] Plato, *Critias*, 109c.
[75] Plato, *Critias*, 114d–120e.
[76] Plato, *Critias*i 121b.
[77] Plato, *Timaeus*, 42d.

or TMP may actively choose bad or evil holotypes, as occurs when individual intellects choose vice or when TCP within a human being overcomes the intellectual elements. [3] The non-artist moving principle, the pile of triangles, possess the capacity to produce the prototypes of the four elements as well as other evil beings. [4] The possibility of choosing holotypes from among evil or impermanent entities underscores that bad ideas, as well as good ideas, can exist. Furthermore, the existence of bad ideas also suggests that the ideas need not be eternal and immortal; instead they may be dependent entities.

6. The Laws of Physics and Ethics

Nature is primarily governed by the laws of physics. Since nature precedes human existence, man-made artificial laws arise only after the physical laws. As new forms of existence are invented by humas -alongside physical existence- corresponding laws also emerge. Conversely, as new laws are introduced beyond the laws of physics, new forms of existence can likewise come into being. Consider a table, a computer chip, a houseplant, cologne, a mask, a child, a dog and a bug. What differentiates these entities is not primarily people's value judgements, linguistic naming processes, or other forms of explanation. Their initial differentiation lies in their morphology, which can be observed directly by human eyes, detected by cameras or other technological devices, or, as seen in Aristotle's philosophy, understood through the reception of sensible forms. This differentiation can also be demonstrated quantitatively by examining their material composition and the arrangement of their components. Beyond morphological distinctions, human reasoning introduces additional layers of separation: *moral laws* that distinguish beings in terms of values, *legal laws* that distinguish beings in terms of rights and responsibilities, and *political laws* that separate beings in terms of identities.

Basing worldviews on moral, legal, and political laws, in addition to physical laws, does not imply disregarding the physical existence of objects. Rather, it may suggest that the philosopher prioritizes the moral, legal or political existence of a being over its physical existence. Naturalist philosophers, who encompass both human actions and physical processes within the domain of nature, argue that the method of natural sciences can explain both ethics and physics. In this context, we cannot be certain whether Anaximander developed a formal ethical system. However, his use of the concept of justice -particularly when emphasizing that the nature of mortal

objects is to disappear and be replaced by new ones[78]- clearly demonstrates that he constructs a physics imbued with ethical connotations.

As for Heraclitus, his cycle of change places fire, earth, water and air in a sequential order, ensuring that no entity escapes from the cycle. As might be expected, since the soul is also an entity, it must exist within the cycle -its logos may increase or decrease-[79] and must reside in a specific sector where the air exists.[80] He even suggested that the gods themselves are within the cycle, inhabiting the sector associated with fire.[81] In this context, Xenophanes, who claims that the god is the unchanging universe, would have to concede that the *god changes,* since the cycle encompasses the entire universe.[82] Now, if the soul were considered a material object according to Heraclitus, it would, as understood from the time of Anaximenes, be on the same sector with air.[83] Again, if the soul emerges in dependence on our biological vitality, its origin would undoubtedly be linked to water.[84] This connection to water is not merely because humans are largely composed of water or because we feel thirst while alive, what is actually meant is that the sperm is water. *The birth and death of the souls is caused by pleasure.*[85] We are born from the sexual desires (sperms) of other souls, and our souls die through our bodily desires such as drinking (alcohol) and the pursuit of sexual gratification.[86] The body pulls us towards water, while the soul strives to ascend to the gods, characterized by fire. Thus, the progression of the cycle as the amount of logos increases, and its regression as the amount of logos decreases must also be applied to the evolution of the soul. According to this, some people are ignorant[87], others are asleep[88], some live by misconceptions[89], and some are akin to animals[90] -conditions stemming from their failure to listen or to care about the logos, i.e. truth.[91]

[78] Thales, Anaximander, and Anaximenes, *Fr.*, D6.
[79] Xenophanes and Heraclitus, *Fr.*, D99.
[80] Xenophanes and Heraclitus, D102.
[81] Heraklitos, *Heraklitos Fragmanlar*, D91, D92.
[82] Xenophanes and Heraclitus, *Fr.*, D48.
[83] Thales, Anaximander, and Anaximenes, *Fr.*, D30, D31.
[84] Xenophanes and Heraclitus, *Fr.*, D100, D102.
[85] Xenophanes and Heraclitus, D100.
[86] Xenophanes and Heraclitus, D104.
[87] Xenophanes and Heraclitus, D15.
[88] Xenophanes and Heraclitus, D1, R54, R56.
[89] Xenophanes and Heraclitus, D2, D3, R108.
[90] Xenophanes and Heraclitus, D79, D80, D13.
[91] Xenophanes and Heraclitus, D5, D4.

Shape 1: Heraclitus' Cycle of Change

Plato articulated moral laws so effectively that it was often assumed he was solely ethicist, with no interest in physics. In his middle dialogues, he described the upper universe as a realm of concepts and geometric shapes, suggesting that all ethical dilemmas capable of being contemplated by humans must be resolved through these the concepts. The material universe is portrayed as a world of trouble and imperfection, while the abstract universe represents a realm of perfection. This stark division between the upper and lower universes presented a challenge to the pursuit of physics, as it seemed to downplay the importance of the material world. To address this, Plato introduced an artistic perspective in *Timaeus*, depicting the upper universe as a heaven inhabited by perfect people. The elements that make *Timaeus* a treatise on physics include:

1. The physical form of the upper universe serves as a model for the lower universe,
2. The material cause of the lower universe is identified as the pile of triangles,
3. There are added moving principles -the Demiurge and the lesser gods- alongside the pile of triangles and the models.

Conclusion

TPLs of natural philosophers are compared below. It is evident that no natural philosopher failed to develop this principle. Plato made two significant contributions to TPL: (1) After Heraclitus, Plato was the first to integrate moral and epistemological laws alongside physical laws. However, since most of his dialogues emphasize moral and epistemological laws rather than physical ones, a prevailing belief emerged that Plato did not engage with physics. This perception likely stems from the fact that Plato's philosophy of ideas was gradually developed across different dialogues; however, this development went unnoticed, and it was assumed that the same philosophy was being repeated in these dialogues. The philosophy of ideas was not presented all at once in *The*

Republic; and the need to engage with physics, on the other hand, became prominent only in Plato's later works, such as *Timaeus*. (2) He elevated TPL to the level *existence*. Unlike earlier mental distinctions -such as Thales' degrees of solidification- Plato introduced separate entities that exist independently of the mind. These entities, as is well known, are the ideas. Plato's concept of an intelligible universe transcending the sensible one had already been established before his engagement with physics, which is perhaps why this innovation initially went unnoticed. However, in *Timaeus*, he reexamines the ideas, imbuing them with life and developing a discourse of "art" absent in the *Republic*. Ideas are no longer mere concepts or shapes but are transformed into living holotypes.

	The Principle of Law	**Characteristic of the Law**	**The Law's Status of Existence**
Thales	The Water's Degrees of Solidification	Physical Law	**-**
Anaximander	The Mediums of Justice and Injustice	Physical and Moral Laws	**-**
Anaximenes	The Air's Degrees of Densification	Physical Law	**-**
Heraclitus	The Cycle of Change, The Amounts of Logos	Physical and Epistemological Laws	**-**
Philolaus	The Numbers	Physical Law	**-**
Empedocles	The Transition from a Neutral Mixture (The Sphere) to Chaos	Physical Law	**-**
Anaxagoras	The Transition from a Neutral Mixture (The Whole) to Chaos	Physical Law	**-**
Leucippus and Democritus	The Mediums of Chance and Necessity	Physical Law	**-**
Plato (in *Timaeus*)	The Holotypes as Models	Physical, Moral and Epistemological Laws	**+**

Table 5: A Comparison of the Principles of Law

Çıkar Çatışması / Conflict of Interest:	Yazar, çıkar çatışması olmadığını beyan etmiştir. / The author declared that there is no conflict of interest.
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REFERENCES

Aktok, Özgür. "İlkçağ Doğa Felsefesinde Özdeşlik ve Değişim Problemi: Thales, Anaximandros, Anaximenes ve Herakleitos." *Kaygı Uludağ Üniversitesi Fen-Edebiyat Fakültesi Felsefe Dergisi* 20:1 (2021): 368–83. https://doi.org/10.20981/kaygi.896773

Akyüz, Yakup. "Sokrates Öncesi (Presokratikler) Doğa Felsefesi." In *Felsefe Tarihi*, edited by Nejdet Durak, 55–92. İstanbul: Lisans Yayıncılık, 2019.

Alican, Necip Fikri. "The Good, The Bad and The Ugly Does Plato Make Room for Negative Forms in His Ontology?" *Cosmos and History: The Journal of Natural and Social Philosophy* 13:3 (2017): 154-191.

Anaxagoras. *Anaxagoras of Clazomenae Fragments and Testimonia*. Edited by David Gallop and T. M. Robinson. Translated by Patricia Curd. The Phoenix Presocratics. Canada: University of Toronto Press, 2007.

Aristotle. *Metaphysics (The Complete Works of Aristotle)*. Translated by Jonathan Barnes. Fourth Printing. Princeton: Princeton University Press, 1991.

Aristotle. *Physics (The Complete Works of Aristotle)*. Translated by Jonathan Barnes. Fourth Printing. Princeton: Princeton University Press, 1991.

Burnet, John. *Greek Philosophy Part 1*. Great Britain: Macmillian and Co. Limited, 1928.

Cevizci, Ahmet. "Platon'un Devlet'teki Bölünmüş Çizgi Analojisi." *Atatürk Üniversitesi DTCF Felsefe Bölümü Dergisi* 13 (1994): 31-134.

Empedocles. *Empedocles: The Extant Fragments*. Translated by M. R. Wright. Michigan: Yale University, 1981.

Empedocles, Parmenides, and Zeno. *Western Greek Thinkers Part 2 (Early Greek Philosophy V)*. Translated by Andre Laks and Glenn W. Most. First Published. London: Harvard University Press, 2016.

Francis M., Cornford. *Plato's Cosmology*. Hackett Publishing Company, 1935.

Guthrie, W. K. C. *A History of Greek Philosophy the Earlier Presocratics and the Pythagoreans*. Cambridge: Cambridge University Press, 1985.

Heraclitus. *The Fragments of The Work of Heraclitus of Ephesus on Nature*. Translated by G. T. W. Patrick. Baltimore: Press of Isaac Friedenwald, 1889.

Heraklitos. *Heraklitos Fragmanlar*. Translated by C. Cengiz Çevik. İstanbul: Türkiye İş Bankası Kültür Yayınları, 2020.

Leucippus and Democritus. *Later Ioanian and Athenian Thinkers Part 2 (Early Greek Philosophy VII)*. Translated by Andre Laks and Glenn W. Most. First Published. London: Harvard University Press, 2016.

Philalous. *Philolaus of Croton Pythagorean and Presocratic A Commentary on the Fragments and Testimonia with Interpretive Essays*. Translated by Carl A. Huffman. First Published. Cambridge: Cambridge University Press, 1993.

Plato. *Critias (Plato Complete Works)*. Edited by John M. Cooper and D. S. Hutchinson. Translated by Clay Diskin. Cambridge: Hackett Publishing Company, 1997.

Plato. *Parmenides (Plato Complete Works)*. Edited by John M. Cooper and D. S. Hutchinson. Translated by Mary Louise Gill and Paul Ryan. Cambridge: Hackett Publishing Company, 1997.

Plato. *Phaedo (Plato Complete Works)*. Edited by John M. Cooper and D. S. Hutchinson. Translated by G. M. A Grube. Cambridge: Hackett Publishing Company, 1997.

Plato. *Phaedo (The Dialogues of Plato)*. Translated by Benjamin Jowett. Third edition. London: Oxford University Press, 1891.

Plato. *Republic (Plato Complete Works)*. Edited by John M. Cooper and D. S. Hutchinson. Translated by G. M. A Grube. Cambridge: Hackett Publishing Company, 1997.

Plato. *Timaeus (Plato Complete Works)*. Edited by John M. Cooper and D. S. Hutchinson. Translated by Donald J. Zeyl. Cambridge: Hackett Publishing Company, 1997.

Thales, Anaximander, and Anaximenes. *Beginnings and Early Ionian Thinkers (Early Greek Philosophy I)*. First Published. London: Harvard University Press, 2016.

Xenophanes and Heraclitus. *Beginnings and Early Ionian Thinkers Part 2 (Early Greek Philosophy III)*. Translated by Andre Laks and Glenn W. Most. First Published. London: Harvard University Press, 2016.

Zeller, Eduard. *Outlines of the History of Greek Philosophy*. Translated by Sarah Frances Alleyne and Evelyn Abbott. New York: Henry Holt and Company, 1889.