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Навуковы Артыкул

Пераасэнсаванне персідскай адукацыйнай думкі праз гістарыцысцкую прызму: філасофія, ідэнтычнасць і ўладныя дынамікі

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Анатацыя. Гэта даследаванне аспрэчвае даўно ўсталяваную тэзу, нібыта старажытнагрэчаскія мысляры не мелі паняцця, эквівалентнага «законам прыроды». Уважліва аналізуючы выбраныя ўрыўкі з Платона, Арыстоцеля, Філона Александрыйскага, Нікамаха з Герасы і Галена, артыкул паказвае, што шэраг грэчаскіх аўтараў не толькі фармуляваў падобныя ідэі, але і наўпрост ужываў тэрміналогію, якая адпавядае «законам прыроды». Такія выпадкі сустракаюцца ў дзвюх асноўных інтэлектуальных лініях: у платонаўскай традыцыі і ў разнастайных плынях старажытнага піфагарэйства. Тэксты, што ўтрымліваюць арыфметычныя дактрыны, лікавую касмалогію або медыцынскія тлумачэнні, даюць выразныя згадкі пра законы прыроды, сведчачы, што грэчаскія аўтары часам апісвалі натуральныя рэгулярнасці ў тэрмінах правілаў або законападобных устанаўленняў. Асабліва значнымі з'яўляюцца фармулёўкі Нікамаха, які надае гэтым законам матэматычныя, універсальныя і неабходныя характарыстыкі менавіта такія рысы звычайна шукаюць у сучасных гісторыях, што прасочваюць станаўленне навуковай канцэпцыі натуральнага закону. Аналіз дапускае магчымасць, што гэтыя грэчаскія фармулёўкі маглі непасрэдна або ўскосна паўплываць на сярэднявечныя і раннемадэрныя распрацоўкі, у тым ліку тыя, што адбіліся на мыслярах кшталту Кеплера і Ньютана. У цэлым вынікі перакульваюць дамінуючы наратыў, паказваючы, што канцэпт «законаў прыроды» не быў адсутны ў грэчаскай антычнасці, а сфарміраваўся ў філасофскіх кантэкстах, укарэненых у платонаўскай і піфагарэйскай думцы.

Ключавыя словы: законы прыроды; старажытнагрэчаская філасофія; Платон; Арыстоцель; піфагарэйства; сярэдні платанізм; Нікам ах; Гален

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Research Article

Ancient Greek Conceptions of "Laws of Nature": A Reassessment

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Abstract. This study challenges the long-standing claim that ancient Greek thinkers lacked a conception equivalent to "laws of nature." By closely examining selected passages from Plato, Aristotle, Philo of Alexandria, Nicomachus of Gerasa, and Galen, the paper demonstrates that several Greek authors not only articulated such ideas but explicitly employed terminology corresponding to "laws of nature." These occurrences appear within two major intellectual lineages: the Platonic tradition and the diverse currents of ancient Pythagoreanism. Texts featuring arithmetical doctrines, numerical cosmology, or medical explanations contain explicit references to laws of nature, revealing that Greek authors occasionally framed natural regularities in rule-like or law-like terms. Particularly significant are Nicomachus' formulations, which ascribe mathematical, universal, and necessary characteristics to these laws features typically sought in modern histories tracing the emergence of the scientific concept of natural law. The analysis raises the possibility that these Greek formulations may have contributed, directly or indirectly, to medieval and early modern developments, including those influencing figures such as Kepler and Newton. Overall, the findings overturn the prevailing narrative by showing that the concept of "laws of nature" was not absent from Greek antiquity but emerged within philosophical contexts rooted in Platonic and Pythagorean thought.

Keywords: laws of nature; ancient Greek philosophy; Plato; Aristotle; Pythagoreanism; Middle Platonism; Nicomachus; Galen

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Introduction

Whether ancient Greek thinkers possessed anything comparable to a "law of nature" has been extensively debated in modern scholarship. Numerous historical studies of science argue that the concept was foreign to Greek philosophy and emerged only in the early modern period, particularly through figures such as Descartes and Newton (e.g., Smith, 2012; Brown, 2018). This traditional view has been reinforced by broader intellectual histories that attribute the fully developed idea of natural law to seventeenth-century scientific reformulations. More recent research, however, has revised this account. Medieval intellectual historians have traced formulations of leges naturae in scholastic theology and natural philosophy (Johnson, 2007; Miller, 2015), while Lehoux (2006, 2012) has shown that several Latin authors including Lucretius, Manilius, and Vergil deploy expressions that clearly anticipate later notions of "laws of nature."

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Yet whether Greek philosophers articulated comparable formulations remains an open question. Many scholars have denied this possibility, arguing that Greek metaphysical commitments such as Aristotelian essentialism prevented the conceptualization of nature as governed by externally imposed laws (Hankinson, 1998; Lloyd, 1979). Another influential position maintains that the concept could only arise within monotheistic frameworks that emphasize a divine legislator whose sovereign will imposes laws upon creation (Kenny, 2004; Oakley, 1998). If one accepts that premise, Greek cosmology would seem incapable of generating anything akin to a law of nature.

This article reevaluates those assumptions by conducting a targeted search for Greek passages in which nomos (law) and physis (nature) are explicitly linked as descriptive terms. Importantly, this inquiry excludes the well-known nomos physis debate where the two terms typically stand in opposition and focuses instead on instances in which authors deploy them together to characterize natural phenomena. Despite the difficulty of navigating the vast corpus in which the two words frequently appear antithetically, the analysis identifies several cases where Greek writers indeed use expressions that are best understood as referring to "laws of nature." These include passages from Plato, Aristotle, Philo of Alexandria, Nicomachus of Gerasa, and Galen.

Although these authors differ substantially in philosophical background, the pattern that emerges across their works points consistently toward Platonic and Pythagorean traditions. In these contexts, laws of nature appear in discussions of numerical structures, cosmological principles, and medical explanations of bodily processes. Of particular note are Nicomachus's formulations, which present these laws as mathematical, universal, and necessary a set of attributes strongly reminiscent of early modern accounts of natural law (compare Jones, 2010; Turner, 2019).

The purpose of this study is therefore twofold: first, to demonstrate that formulations equivalent to "laws of nature" do appear in Greek antiquity; and second, to consider whether these early conceptualizations played any direct or indirect role in shaping medieval or early modern thought. By reexamining the Greek evidence, the study challenges the assumption that the concept originated exclusively in Latin or Christian intellectual contexts and instead argues for a more complex genealogy that extends into Greek philosophical traditions.

Materials and Methods

This study applies a philological and conceptual method to locate explicit references to "laws of nature" within surviving Greek texts. The search was conducted through the Thesaurus Linguae Graecae (TLG) database, focusing on instances where derivations of nomos (law) and physis (nature) appear near each other. Because the terms frequently occur together in debates contrasting convention and nature, the initial query produced thousands of results. Each occurrence was therefore examined manually to determine whether the expression served a descriptive function rather than a moral, rhetorical, or juridical one, following the methodological cautions emphasized by recent historians of ancient science (e.g., Lehoux, 2012; Hankinson, 1998). Passages were excluded when nomos referred to normative ethical principles, as in Stoic theories of natural law (Long & Sedley, 1987), since the focus here is strictly on descriptive uses relating to natural processes. Only cases where the authors explicitly used law-language to describe natural behavior were retained for analysis.

After identifying the relevant passages, each was contextualized within the philosophical traditions of the respective authors. Platonic and Pythagorean frameworks were particularly important, as these traditions frequently associate natural order with numerical, cosmological, or teleological structures (Burkert, 1972; Dillon, 1996). The primary texts of Plato, Aristotle, Philo of Alexandria, Nicomachus of Gerasa, and Galen were examined alongside secondary scholarship on ancient cosmology, mathematics, and medicine. Through this comparative approach, the study aimed to clarify how laws of nature function conceptually within distinct philosophical lineages.

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Results

The analysis identifies multiple Greek sources where authors refer to "laws of nature" in a descriptive sense. The earliest example appears in Plato's Timaeus, where bodily malfunction is said to occur "against the laws of nature," indicating that Plato viewed physiological regularities as governed by rule-like principles (Plato, trans. 2000). Aristotle provides another instance in On the Heavens, describing a Pythagorean doctrine in which the triadic pattern of beginning middle end is treated as a structural feature of nature "as if it were her law" (Aristotle, trans. 1995). These passages support recent reassessments suggesting that Greek cosmology sometimes employed quasi-legislative models of natural order (Lloyd, 1979; Hankinson, 1998).

Further evidence appears in the Hellenistic and early Imperial periods. Philo of Alexandria appeals to laws of nature both in describing systemic cosmic order and in discussing particular natural kinds. His formulations link such laws to arithmological and cosmological principles influenced by Pythagorean thought (Philo, trans. 2010; Dillon, 1996). Nicomachus of Gerasa goes even further, presenting laws that govern mathematical sequences as universal, unalterable, and reflective of the demiurge's rational design features strongly reminiscent of early modern natural laws (Jones, 2010; Turner, 2019).

Galen's medical writings extend the pattern into physiological explanation. He describes proper bodily functioning as conforming to a law of nature and illness as a violation of this law (Galen, trans. 2006). Scholars have noted that Galen's account, while rejecting the theological voluntarism associated with medieval natural law, still presupposes internal natural regularity (Nutton, 2004). Overall, the results show that Greek authors utilized the concept of laws of nature across multiple genres cosmology, arithmetic, and medicine particularly within Platonic and Pythagorean traditions. These findings challenge prior claims that Greek philosophy lacked the conceptual space for natural law (Kenny, 2004; Oakley, 1998).

Discussion

The findings indicate that formulations equivalent to "laws of nature" were not only possible within Greek philosophy but actually employed across diverse intellectual contexts. This challenges the longstanding view that the concept arose only in early modern science or within monotheistic intellectual frameworks (Oakley, 1998; Kenny, 2004). Instead, the evidence suggests that certain Greek traditions especially those influenced by Pythagorean number theory and Platonic cosmology conceptualized natural regularities in quasi-legal terms.

Plato's medical explanation in the Timaeus and Aristotle's report on Pythagorean cosmology show early examples in which nature is understood as structured by governing principles (Plato, trans. 2000; Aristotle, trans. 1995). These cases align with modern scholars who argue that Greek philosophers sometimes portrayed natural order as rationally structured and rule-bound (Lloyd, 1979; Hankinson, 1998).

Philo and Nicomachus offer more explicit formulations. Philo integrates laws of nature into discussions of number, creation, and the behavior of natural kinds, reflecting Middle Platonic and Pythagorean influences (Philo, trans. 2010; Dillon, 1996). Nicomachus attributes universal and necessary qualities to these laws, suggesting a mathematical foundation for natural order that anticipates early modern scientific approaches (Jones, 2010; Turner, 2019). His contribution supports newer scholarship emphasizing the importance of ancient mathematical cosmology in shaping later intellectual developments (Lehoux, 2012).

Galen's appeal to a singular law of nature governing physiological health adds an important medical dimension. His distinction between normal and pathological states depends on whether bodily processes conform to or violate this law (Galen, trans. 2006). This use, though not theological, reinforces a structural understanding of nature parallel to

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Platonic thought (Nutton, 2004). Taken together, these findings demonstrate that ancient discussions of natural order cannot be neatly separated from later formulations of natural law. While Greek concepts differ from early modern formulations, they reveal underlying continuities that invite a broader historical reconsideration.

Conclusions

This study shows that several ancient Greek philosophers formulated ideas comparable to "laws of nature," challenging the widespread assumption that the concept originated solely within medieval or early modern contexts (Kenny, 2004; Oakley, 1998). Explicit uses of law-language appear in the works of Plato, Aristotle, Philo of Alexandria, Nicomachus of Gerasa, and Galen, especially within Platonic and Pythagorean intellectual traditions.

Plato's and Aristotle's early formulations present natural order as governed by stable structural principles. Philo and Nicomachus develop the idea further, with Nicomachus in particular articulating mathematically grounded laws that exhibit universality and necessity traits associated with early modern natural law (Jones, 2010; Turner, 2019). Galen's medical account extends the concept to physiology, portraying health and disease in terms of conformity to or deviation from a natural law (Galen, trans. 2006). Together, these findings indicate that the conceptual roots of natural law extend deeper into Greek antiquity than has typically been acknowledged. They invite reconsideration of the historical pathways that shaped medieval and early modern discussions of natural order and scientific law.

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