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The Distinction Between Existence and Essence and the Issue of the Independence of Science from Theology Based on Avicenna's Rationalist Metaphysical System

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ABSTRACT

In Avicenna's era, intellectually and culturally, science was subsumed under theology, and particular sciences were conceived as secondary/subsidiary to theology and religion. The author's primary question is how Avicenna confronted this challenge and what solution he proposed to rescue particular sciences from the dominance of theology. As a prominent philosopher and metaphysician, Avicenna identified the fundamental cause of science's subordination to theology in the attribution of the laws of nature to divine will and habit. To resolve this crisis, Avicenna distinguished existence from essence, thereby freeing the laws of nature from direct reliance on divine will and grounding particular sciences within the autonomous realm of essence. Consequently, he governed particular sciences by the logic of the world of independent essences. By situating particular sciences within the realm of essence, these sciences became systematized through the necessity and universality inherent in this domain, ultimately transforming into calculable and predictable elements. Finally, despite the methodological independence of particular sciences, their epistemological principles and presuppositions are referred back to philosophy, ensuring that the fundamental link between philosophical thought and the epistemic structure of the sciences is preserved at a foundational, non-theological level. This article has been written using a descriptive-analytical method.

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Introduction

The issue of the nature of science, particularly particular sciences, has been one of the most central questions in human thought throughout history. This issue has been addressed in various ways across four prominent intellectual traditions—Aristotelian, Stoic, Christian (especially in the thought of Augustine), and Ash‘arite theology in the Islamic world—with each tradition offering a distinct answer to this fundamental question based on its metaphysical framework. In this era, the analysis of and response to this question became intricately tied to the relationship between God, nature, and its laws. Is the law of science and nature independent of the divine will, or must it be understood as subordinate to divine will and volition?

Aristotle adopted a radical position on this issue toward establishing the independence of essence and natural causality from any divine will. He created a deep chasm between God, nature, and its laws, taking a strongly negative view regarding God’s creation of the world and its laws. In the *Metaphysics*, by denying an efficient causal relationship between God and nature, Aristotle rendered the law of nature independent of divine will, writing in Chapter 3 of Book XII: "Neither the matter comes to be nor the form" (Aristotle, 2006, 1070a)¹. Subsequently, in a key passage (1074a), he elaborates on why God—by virtue of His immutable perfection—cannot be the efficient cause of the world, as efficient action entails motion and change in the agent, which contradicts divine necessity.

In this self-sufficient system, the "substantial form" operates on its own as a sufficient factor to explain the relations of the natural world. Indeed, in the Aristotelian universe, every natural entity possesses a form that determines its essence, motion, and properties, such that the cause of motion or growth in an entity lies not in an external, volitional command, but within the structure of the entity itself. Aristotle illustrates this intrinsic autonomy with the argument that "nature is a principle of motion that is in the thing itself (for man begets man); other causes are the absence of these two principles... man begets man, that is, a particular man is begotten by a individual father" (Aristotle, 2006, 1070a). This argument shifts the necessity of seeking causes from the realm of theology to that of physics, as he explicitly asserts in the first chapter of Book VIII of the *Physics* that nature itself is the cause of order (Aristotle, 2006, 252a). Thus, by substituting "essential necessity" for "divine will," Aristotle established a framework in which the laws of nature are not reflections of a creator's desire, but manifestations of the self-sufficiency of substantial forms.

The fundamental autonomy of nature must be regarded as one of the most critical distinctions separating Aristotle’s philosophy from Stoicism and subsequent Abrahamic theologies—a distinction that ultimately paved the way for the emergence of an empirical science independent of the divine and religion.

¹ Nature in this sense is the principle of motion in natural things, which resides potentially within those things (Aristotle, 2006, 1015a). Nature is the growth of a growing object (Aristotle, 2006, 1014b).

In contrast to Aristotle's radical stance on the autonomy of nature, a trend entirely opposed to Aristotelian thought arose in metaphysics through the Stoics and, to some extent, their Christian and Muslim successors. Despite distinct metaphysical differences, Stoic philosophy converged on the central and fundamental idea that nature must be understood and interpreted as subordinate to divine will. According to this conception, nature and its laws do not constitute a realm independent of divine volition; rather, a unified order prevails that has created the universe, enacted its laws, and sustained it at every moment (Inwood, 2022, 366–369). This ontological link binding the laws and essence of the natural world to the divine will forged an inextricably linked relationship between science and theology, rendering science as an autonomous domain impossible.

The pervasive presence of divine will in governing nature and its laws—facilitated by the influence of Stoic-Christian thought in Islamic society—laid the groundwork for the emergence of the Ash'arite school. Consequently, the first encounter of Muslim scholars with this issue transpired within the realm of theology. The Ash'arites adopted a far more radical position against natural causality and the independence of essence from divine will. In their view, whatever occurs in the cosmos is caused directly and immediately by God; there is no intrinsic or necessary relation between phenomena, and only a "divine habit" accounts for the succession of events. In this view, nature and the essence of things lack any causal autonomy. An entity possesses no intrinsic properties *in itself*, and all properties and effects are created directly by God in every moment and every event. To explain the continuity of natural phenomena, the Ash'arites advanced the theory of "continuous creation", holding that God creates the universe anew at every instance¹.

In practice, the Ash'arite perspective gained swift acceptance within Islamic society and absorbed into general social culture, such that even the identity of sciences like mathematics and astronomy was harnessed to serve theological ends and justify religious doctrines. The Ash'arite conception of natural law attributed natural effects to divine habit rather than to an inherent, law-governed necessity within natural elements—a necessity that would make nature predictable. By doing so, it removed the calculability and predictability of nature from human

¹ These three intellectual traditions exhibit three distinct models regarding the relationship of divine will to natural causality and the autonomy of essence: the model of identity and immanent determinism (Stoicism), the model of instrumental autonomy alongside teleological dependency (Augustine), and the model of denying autonomy in favor of immediate divine sovereignty (Ash'arism). Each model bears profound implications for the possibility and nature of empirical science, the problem of evil, and the conceptualization of the human relationship with God and nature. Grasping these distinctions is essential not only for the history of religious thought, but also for understanding the epistemological roots of theories of science in both Islamic and Western civilizations.

² Although the impact of the Ash'arite worldview was predominantly evident in the practical sphere, science followed an independent path at the theoretical level. Muslim scholars such as Al-Khwarizmi, Al-Biruni, Khayyam, and Ibn al-Haytham investigated scientific principles independently, yielding significant innovations in mathematics, geometry, astronomy, and optics that were later embraced by Western scholars during the advent of modern science.

reach, thereby blocking the path toward establishing particular sciences as an autonomous realm (Halabi, 1994, 93–94).

The Accidentality of Existence to Essence and the Independence of the Realm of Being from the Realm of Essence

The independence of science from theology in the history of Islamic thought required a fundamental revolution in metaphysics; for that which had established the authority of theology over all intellectual spheres in pre-Islamic philosophical history—as well as during the formative period of the Islamic intellectual and cultural heritage—possessed deeply ontological and metaphysical roots. As noted in the introduction, the weakening of natural causality in favor of divine will, alongside the interpretation of natural law under divine volition and habit, served as a subversive factor leading to the collapse of the autonomy of science.

For this reason, in order to lay the groundwork for demarcating the boundary between science and theology, Al-Farabi and Avicenna engaged with highly complex metaphysical concepts that directly targeted the root of divine authority within metaphysics. They correctly understood that talking about the independence of science is possible only if conceptual room can be prepared within metaphysics for the independence of natural causality and the laws of nature from divine will. They considered the independence of nature from theology to be achievable solely through the distinction between essence and existence. According to Avicenna, we must distinguish between two types of actuality, 1-Essential Actuality (The First Perfection): The essence and specific form .2- Existential Actuality (The Second Perfection): The act of "being" itself and "external realization."

In Avicenna's view, this distinction between two forms of actuality lays the groundwork for the theory of "essential contingency" and "existence as superadded to essence"¹. He writes in the *Ta'liqāt (Remarks)* regarding the distinction between existence and essence:

The existence of 'bodies' and 'accidents' (and generally the existence of the sensible world) is evident. Yet for all these entities, their existence lies outside their essence (*quiddity*); for all these essences fall under the 'ten categories' (Avicenna, 1984, 189).

The reason for the distinctness of existence from essence, according to Nasir al-Din al-Tusi's interpretation of Avicenna's position, is that a human being may grasp the meaning of a triangle yet doubt whether this essence is characterized by existence in external reality. Even after it is

¹ To this day, consensus remains elusive among scholars regarding what Avicenna precisely meant by "accidentality"—specifically whether he intended a mental and analytical accidentality, or whether he considered the external world to be the locus of this accidentality. However, the majority of researchers have interpreted it as an analytical, intellectual accidentality rather than an external or categorical one (see, for example, Dinani, 2010: 272–311).

clear that a triangle consists of lines and a surface, it remains undetermined whether it exists in external reality (Al-Tusi, 2004, vol. 2, 552).

If we accept that the meaning of an essence can be evident to us while we remain in doubt about its existence, we can maintain that the intrinsic reality of an essence is devoid of concepts such as existence and non-existence, with neither side serving a constitutive role relative to the essence. As Fakhr al-Din al-Razi explains in his commentary on the *Ishārāt*, the intrinsic reality of essence stands in a position of equal neutrality toward both existence and non-existence, and "essence is neutral regarding whether existence supervenes upon it or not" (Al-Razi, 1984, vol. 2, 52).

The Distinction Between Existence and Essence: Opening a New Horizon in the Independence of Essence from Divine Will and Purposes

After Avicenna distinguished existence from essence and established the realm of existence as independent from the realm of essence, he described two types of causedness for essence based on different respects. According to Avicenna's thought, there are two types of causedness for essence: 1- Causedness in respect of essence 2- Causedness in respect of existence. Corresponding to these two considerations of causedness, he distinguishes between essential causality and existential causality explaining existential cause in terms of final and efficient causes. Among these two considerations, he assigns causedness in respect of essence to a non-ontological domain—which is the proper domain of quidditative matters—traditionally known in his philosophy as the material cause and the formal cause. Nasir al-Din al-Tusi writes in his commentary on the *Ishārāt* regarding this point:

Consider a triangle, whose essence depends on a surface and lines; these two serve as the constitutive element of the triangle qua triangle. Thus, these two—namely, the parts of the triangle's essence and the essence of the triangle itself—act as the material and formal causes of the triangle (Al-Tusi, 2004, vol. 2, 549).

Essence is a composite entity made up of formal and material parts, and its intrinsic reality is realized through their combination. Hence, the intrinsic reality of an essence depends on two quidditative causes—material and formal—without any intervention of ontological factors or divine will in the quidditative subsistence of that intrinsic reality. With this explanation, it becomes clear that the intrinsic reality of an essence occupies an autonomous status, rendering any efficient role in the quidditative subsistence of an essence meaningless; because, as noted above, quidditative actuality qua intrinsic reality depends solely on formal and material causes, even though this same essence requires an efficient cause if it is to come into existence. As cited from Avicenna, "God did not make the apricot an apricot, but rather brought it into existence"; that is, divine enactment does not apply to the essential constituents of a thing, but rather to their existence (Hasanzadeh, 2008, vol. 3, 105; Ashtiani, 1999, vol. 2, 326).

By separating quidditative actuality from existential actuality on the one hand, and establishing the independence of quidditative actuality from divine will on the other, essence

must be regarded as a blueprint according to which God actualizes realities. Relying on the distinction between quidditative actuality and existential actuality, one can explain that essences, at the level of rational determination, prefigure the universal system of becoming . Within this framework, divine will acts not as an accidental principle independent of knowledge, but as the efficient determination of providential knowledge. In this sense, the best possible world resides within God's knowledge by virtue of rational necessity, and God's will impart objective existence to this possible order based on that very rational knowledge. Therefore, the conformity of divine action to the intelligible order of essences does not signify the submission of will to a blind external necessity; rather, it expresses that God, through His wise and rational will—which are identical to His essence—actualizes the valid, intelligible order of goodness:

The Necessary Existent... apprehends (intellects) the order of goodness in the most perfect manner possible. Then, that which He has intellectured as order and goodness emanates from Him in the most complete manner that He intellectured it—an emanation that realizes the order in the best and most perfect way possible. This is the meaning of Providence ([Avicenna, 2009, vol. 1, 415](#)).

This text demonstrates that in Avicenna's philosophy, God intellects the best possible order based on fixed and independent realities (the essences in themselves) and then bestows existence upon them. In this article, based on a reading of Avicenna's philosophy, quidditative realities are considered in divine knowledge as the intelligible and fixed determinations of the cosmic order. This means that God intellects the best order based on these intelligible determinations and then, through the emanation of existence, actualizes them externally. From this perspective, essences are understood not as independent entities confronting God, but as the divine object of knowledge and the foundation for intellecting the best order. Therefore, what emanates from God is the existence of things, not the essence as something independent of divine agency. Consequently, speaking of the stability of essences refers to their stability in the locus of divine intellecting and knowledge, not their existential independence from the Necessary Existent.

In fact, the intrinsic reality of the possible order as a quidditative matter requires merely its own quidditative components in its quidditative subsistence, and this does not contradict the fact that if this same quidditative subsistence is to be realized externally as an existing thing, it must be enacted following the divine enactment that attaches to its existence. For this reason, Avicenna believes that the best possible order possesses a specific sequence and detail, and God actualizes and creates the best possible order based on an essential sequence and detail on the one hand, and its proper and specific timing on the other. This timing and its internal sequence and detail are determined according to the essence of that entity, not merely God's arbitrary will:

If you seek an escape (from this issue), you have no choice but to say: the conception of the universal order (of the universe) in prior knowledge (divine knowledge), along with its necessary and proper timing, causes that order (the universe) to emanate from Him in its sequence and detail in an intelligible and knowledge-based manner, and this is Providence itself (Avicenna, 2002, 298).

In reality, essence and quiddities qua intrinsic realities and quidditative subsistence do not depend on a blind will that assumes various forms through an accidental process. Rather, before entering the process of essential genesis, the divine will—by intellecting their independent quidditative subsistence in themselves through rational manifestation—opens itself toward creating the realities of quidditative matters, and essences become determined as an autonomous domain. As evident from the above passage, this condition in Avicenna's philosophy is described by providential knowledge and action. Avicenna writes in the *Ishārāt* describing providential knowledge:

Providence consists of the First God's all-encompassing knowledge of everything, of how everything ought to be so that it resides in the best order, and that the best order necessarily emanates from Him and from His all-encompassing knowledge. As a result, the existing thing comes into being in accordance with what is known (what is in God's knowledge) according to the best order, without any separate intention or seeking (a distinct will) arising from the First True God. Thus, the First God's knowledge of the proper sequence of the existence of all things is the source for the emanation of goodness into everything (Avicenna, 2002, 333).

According to this conception, Avicenna stands in opposition to the view that understands nature and its laws as subordinate to divine command and logos. In this manner, he affirms the pre-volitional existence of essences within the intellect of God and rejects the post-volitional existence of the intrinsic reality of essence. That is, unlike the Ash'arites¹, he does not believe that no essence exists prior to divine creation—neither in objective existence nor in knowledge-based existence—and that God not only enacts existence but also invents and originates the essence itself.

¹ From the Ash'arite perspective, stating that "the essence of fire possesses the property of burning" is like saying "lunch always arrives after the clock chimes." This is a habit, not an essence; and since this habit is God's act, essence itself is nothing more than a mental abstraction from God's act. Thus, essence is nominal (constructed by the mind) and dependent on divine enactment (God created it, rather than discovered it). This view represents the most radical sanctification of God's absolute power against any autonomy for the natural world. Therefore, the essence of fire is merely a nominal label for a divine habit, not a causal reality.

The Genesis of Particular Science Around the Axis of Autonomous Essence and the Separation of Particular Science from Theology

By establishing the independence of the realm of essence and intrinsic reality from existence on the one hand, and assigning particular sciences to quidditative matters on the other, Avicenna paves the way for separating science from theology. Particular sciences are thereby detached from a theological, devotional, and revelatory logic, determining their own structure through an autonomous and rational logic. In fact, the ontological disconnection of essence from existence and divine enactment opens a new horizon in the history of thought, wherein science henceforth realizes the structure of particular sciences through its own rational and independent logic.

Up to this point, it has been clarified that in Avicenna's philosophy we encounter two types of actuality: existential actuality and quidditative actuality. The question is: with which of these domains do particular sciences deal? Does science develop within the terrain of existential actuality and its possibilities, or does it take root in the soil of quidditative realities, organizing the structure of particular sciences based on their internal possibilities?

Avicenna adopts an explicit and clear stance on this issue in the *Physics* of *Al-Shifā'*. According to numerous passages found throughout his works, particular sciences pay no attention to the question of existence and existential actuality, rendering no judgment upon it. Particular sciences assume existence as given and devote their focus to nature from various aspects. For this reason, a particular science such as natural science considers the existence of nature as its starting point and foundation, without treating the existence or non-existence of its subject matter as an object of research, a problem, or a goal to be proven (Avicenna, 2009, vol. 4, 31). Consequently, in the *Physics*, he asserts that the natural scientist should not be sensitive to the existential actuality of nature, nor engage in argumentation concerning it, nor attempt to convince someone who denies the existence of nature through demonstration. "The natural scientist is not required to engage in debate with someone who denies the existence of nature" (Avicenna, 2009, vol. 4, 31); for proving the existence or non-existence of realities is the duty of First Philosophy, which must devise provisions for the existential actuality of various subject matters based on mechanisms present within metaphysics. The mission of the natural scientist is to address the quidditative actuality of their subject matters, and the entire endeavor of the natural scientist must be devoted to investigating the essence of nature, its structure, and its characteristics. "Proving the fundamental existence of nature is the duty of one who engages in First Philosophy (metaphysics); the natural scientist is obligated to investigate and define the essence of nature" (Avicenna, 2009, vol. 4, 31). Instead of occupying themselves with proving the existence of their subject matters, the natural scientist must first define the concept and essence of nature, and through revealing the reality of their subject matters, address the problems raised around the essence of nature.

The centrality of essence in particular sciences and the natural scientist's divergence from proving the existence of their subject matters mean that whenever both the existence and definition of a subject in a science remain hidden, the practitioner of particular sciences merely establishes and reveals the essence of the subject while remaining indifferent to its existence. "If both the existence and the definition of a thing are hidden, only its definition is posited in the science" (Avicenna, 1994, 248). For this reason, in *Al-Shifā'*, instead of explaining how nature's existential actuality comes to be, he begins natural science by defining the essence of nature and subsequently proceeds to its surrounding problems.

Nature is defined as follows: "Nature is the primary principle of motion and rest in that in which it exists, essentially and not accidentally." The intention of this definition is not that nature must be the principle of both motion and rest in every single thing; rather, it means that nature is the principle of every essential attribute realized for a thing, either in terms of motion (if it possesses it) or in terms of rest (if it possesses it) (Avicenna, 2009, vol. 4, 31).

After explaining the centrality of essence in natural sciences, Avicenna attributes the diversity and plurality of particular sciences to the internal relations of essences. Based on the semantic scope of the essence of nature, he assigns various dimensions to essence; by demonstrating a broad spectrum within the reality of nature, he presents different particular sciences in accordance with the scope of the meaning of nature. This view considers the science that deals with nature as the foundation of sciences among the particular sciences, and by analyzing the subject matter of natural science, it derives other particular sciences from the constraints of its subject matter.

According to Avicenna, natural science is like a robust tree whose various branches grow from within under the shade of its flourishing. In accordance with this description, a particular science, like a tree, possesses roots and various branches arising from within it, where the root and trunk of the tree of science is *Kiyān* (natural philosophy) or nature, and its branches expand based on their generality into: 1- *Al-Samā' wa al-Ālam* (On the Heavens and the World) 2- *Kawn wa Fasād* (On Generation and Corruption) 3- *Al-Āthār al-Alawiyah* (Meteorology) 4- *Ma'ādin* (Minerals) 5- *Nabāt* (Plants) 6- *Ṭabā'i' al-Ḥayawān* (The Natures of Animals) 7- *Kitāb al-Nafs wa al-Ḥiss wa al-Maḥsūs* (The Book of the Soul, Sense, and the Sensible). Avicenna writes in treatises on wisdom and natural sciences:

Natural wisdom is of two kinds: a part that serves as the principle and a part that serves as the branch; and that which serves as the principle consists of eight sections. In the first section, the general attributes common to all natural things are known, such as matter, form, motion, nature, finitude, infinitude, the dependence of motions on movers, and the proof that the series of motions leads back to a First Mover who is one, immovable, infinite in power, neither a body nor in a body; these topics are discussed in the book *Kiyān*. In the second section, the states of the bodies of the cosmos's pillars—namely the

celestial spheres and what resides in them, as well as the four elements, their natures, motions, positions, and the wisdom of their creation and order—are investigated, which is presented in the book *Al-Samā' wa al-Ālam*. In the third section, the condition of generation and corruption, coming-to-be and passing-away, growth and alteration are explained in an absolute and non-detailed manner; furthermore, the number of primary bodies capable of receiving these states, and the subtlety of divine craftsmanship in linking earthly matters with celestial ones, and the preservation of species despite the passing-away of individuals through two celestial motions—one eastern and the other western, inclined, and opposite to it—are elucidated, making clear that all of this is by the decree of the Mighty, All-Knowing God; these topics are contained in the book *Kawn wa Fasād*. In the fourth section, states supervening upon the four elements prior to mixture are discussed, regarding the types of motions, rarefaction, and condensation under the influence of the spheres; thus, atmospheric signs, meteors, clouds, rain, thunder, lightning, haloes, rainbows, thunderbolts, winds, earthquakes, seas, and mountains are investigated, which are contained in three treatises of *Al-Āthār al-'Alawiyyah*. In the fifth section, the states of mineral entities presented in *Kitāb al-Ma'ādin*—the fourth treatise of *Al-Āthār al-'Alawiyyah*—are explained; in the sixth section, the states of plants in *Kitāb al-Nabāt*; in the seventh section, the states of animals in *Ṭabā'i' al-Ḥayawān*; and in the eighth section, the knowledge of the soul and the perceptive faculties of animals, particularly humans, and the proof that the human soul does not perish with the death of the body and is a spiritual and divine substance, which is contained in *Kitāb al-Nafs wa al-Ḥiss wa al-Maḥsūs* (Avicenna, n.d., 109–110).

In the passage above, the distinction among sciences is described hierarchically (longitudinally); however, the distinction and plurality of particular sciences are not limited to a hierarchical state. Rather, in addition to the hierarchical distinction of sciences that arises under the scope and limit of essence, we encounter a diversity of sciences situated side by side (horizontally). The distinction among sciences that arise regarding a single subject matter is possible in various ways:

Either one of the two sciences investigates the subject matter in an absolute manner while the other investigates the same subject matter only from a specific aspect; or each of the two sciences discusses the subject matter from an aspect different from that which the other science considers in the subject matter. For example, the cosmic body or the celestial orb is treated as the subject matter by both the astronomer and the natural scientist. However, body in general, accompanied by a condition, is the subject matter of natural

science—namely that body is an essential principle of motion and rest. Meanwhile, the astronomer considers body or celestial orb under another condition—namely that the celestial body possesses quantity, even though they share in the discussion of the sphericity of the celestial body (Avicenna, 1994, 215–216).

Transition from Divine Habit to Natural Necessity: Opening to the Calculability of Particular Sciences Through Rational Experience

By distinguishing existence from essence and rendering it independent from divine will, Avicenna removes the realm of quidditative realities from contingency, randomness, and arbitrariness, opening a path toward systematizing the quidditative universe of nature. Whenever the universal and necessary character of natural relations is accepted, the course of the natural world separates from divine will and habit; natural relations pursue a path independent of divine habit, and the explanation of causes and conditions of events no longer requires direct and repeated reference to divine will or divine intervention. In other words, the natural scientist can explain phenomena through natural causes based on understanding natures and their internal imperatives, without mentioning God's name or appealing to divine providence under every specific event.

According to this conception, one cannot claim that because no necessity exists between quidditative nature and its effects, fire might freeze and congeal objects tomorrow instead of burning them; for he attributes the effects present in the natural world to quidditative realities, explaining the diversity of effects through the quidditative plurality of the world (Avicenna, 2009, vol. 4, 35)¹. Because this relation is immutable, one cannot alter it to its opposite course through the exercise of an external, arbitrary will, such that an opposite effect appears instead of the usual constant effect. Consider, for example, the effect of heat in relation to fire, where heat has always appeared following fire: "Coldness and moisture are accidents that are

¹ If we accept that particular sciences speak of natural essences and their effects, then the aspect of the existential actuality of the natural world will not be of concern to particular science, and only objective entities in terms of their essence and effects are considered by the natural scientist. In fact, although the natural scientist studies external entities, external entities here are considered from the perspective of the realm of quidditative realities, not from the perspective of their existential actuality. However, it must be noted that the logic of essence and its effects—which is of interest to particular sciences—requires existence to reach actuality; that is, as long as quidditative relations and their effects do not exist, the diversity of effects that constitutes the logical necessity of essences will not transform into an actualized matter. Nevertheless, existence plays merely the role of actualizing essence and its effects, which is the concern of particular sciences, holding no internal role within the structure of particular sciences. For this reason, particular science deals in the realm of realities with natures alongside the requirements of their effects, acting indifferently toward their existential demands. In his view, the problem of the sciences is to explain the logical and necessary relationship between effects and various natures, not to explain the existential relationship of effects with various natures. Hence, he writes in the *Demonstration of Al-Shifā'*: In the sciences, "demonstration is established for their essential accidents. However, as for essential accidents, if needed, only their definition is posited, not their existence" (Avicenna, 1994: 249). In truth, particular sciences look to the realm of the analytical and necessary relationship of effects with nature, remaining indifferent to the existential realm in which objective and existential actualities of effects are discussed.

necessary and essential to this nature [water]" (Avicenna, 2009, vol. 4, 35). The necessity and essentiality of the effect along with nature constitute the path through which a law-governed process can form in nature, allowing natural relations to adopt an independent and unalterable course¹.

Avicenna believes that the main focus of particular sciences concerns this necessary aspect of essence in relation to its effects, providing the axis for distinguishing particular sciences from one another and giving rise to different branches of science. However, he does not limit sciences merely to the relation between essence and its necessary effects; rather, he maintains that particular sciences can also consider the separated effects and properties of essence and explain the relations existing among them. For this reason, he considers accidents either as necessary matters directly related to the intrinsic reality of natural essence, or as being imposed upon it under specific conditions by an external element: "Those accidents are either necessary to it or supervene upon it from without" (Avicenna, 2009, vol. 4, 34). In science, we investigate either essence with its necessary accidents and effects, or essence from the perspective of its relation to effects belonging to another essence.

This intrinsic ontological necessity between the quidditative nature of the world and its effects prepares the ground for the epistemological systematization of the natural world, enabling humans to penetrate and comprehend the order of nature through their cognitive tools. For this reason, Avicenna validates human cognitive faculties in knowing the natural world, regarding the study of nature through sensory experience and syllogism as the starting point of human knowledge concerning particular sciences, thereby removing the methodological obstruction in discovering the natural world resulting from the Ash'arite view of nature². Thus, he considers experience to be the starting point of human knowledge of the world, grounding rational knowledge concerning the natural world upon it (Avicenna, 2009, vol. 9, 224). Given these premises, he explicitly rejects any idea or concept (such as divine habit) external to rational experience that would determine human understanding of nature prior to experience, treating all knowledge as the result of the process of "acquisition" through the senses and intellectual activity. Avicenna states in the *Ta'liqāt*:

The human being's first cognitive instrument is sensation, which perceives only the outer appearances of things; subsequently, through their internal faculties and intellect, humans

¹ Although in the Aristotelian system natural causality always stands under the agency and teleology of God (as the final cause and prime mover), from the perspective of investigating the internal mechanisms of the world, natural causes operate as if possessing an independent systematicity free from direct, momentary interventions. "Whatever changes changes from something to something. That by which change occurs is the immediate mover; that which undergoes change is matter, and that to which change leads is form" (Aristotle, 2006, 1070a). "Nature is the principle of motion that is in the thing itself (for man begets man); other causes are the absence of these two principles" (Aristotle, 2006, 1070a).

² For further explanation, refer to the following sources: Al-Ghazali, *Al-Mustaṣfā min 'Ilm al-Uṣūl*, vol. 1, p. 94; Al-Ghazali, *Mi'yār al-'Ilm*, pp. 103–104.

distinguish between similar and diverse perceptions, attaining an understanding of some of their properties and necessary attributes (Avicenna, 1984, 34, 82).

Denying the authority of pre-empirical principles such as divine habit and referring it instead to human experience and intellect marks the beginning of a path through which science becomes a calculable and predictable entity, separating its course from theology—whose primary characteristic is its unpredictability and incalculability. Methodological systematicity in Avicenna's framework rescues science from continuous dependence on theology, granting it autonomy and validity. To discover the order of the natural world, he proposes a four-stage method in which sensory observation and empirical repetition alone are insufficient, while rational analysis and demonstration play a decisive role¹. In this method, the natural scientist first records particular phenomena through sensory observation (Avicenna, 2002, 308). Next, he repeats this observation multiple times to ensure the phenomenon is not accidental. Then, with the aid of the principle of simultaneous presence and absence, he observes and tests the persistence or non-persistence of that effect relative to the quidditative nature, monitoring the presence and absence of the effect in relation to the presence and absence of the quidditative nature (Avicenna, 1994, 546). This methodological feature helps him distinguish the observed relation from random factors. Finally, through rational analysis and demonstration, he comprehends the intrinsic necessity of the relationship between phenomena in the natural world; in this sense, particular sciences dictate through rational method that a stone falling to the ground is a necessary and unalterable law, not merely a habit or repeated accident. In this method, rational analysis plays the decisive role, and mere repetition of observation is not enough to discover a law; for although repetition increases the probability of a relationship's existence, it cannot guarantee its intrinsic necessity (Avicenna, 1994, 318). This necessity is perceptible only through intellect and demonstration, without which science can never attain certainty. It is for this reason that Avicenna, unlike strict empiricists, considers observation and repetition necessary conditions but not sufficient ones, emphasizing that discovering the laws of nature remains incomplete without rational analysis and the perception of intrinsic necessity.

Of course, according to Avicenna, it is not the case that one can penetrate the understanding of the quidditative natural world through rational analysis and demonstrative certainty to grasp its universal and necessary behavior with absolute certitude. This is because such a manner of penetrating nature's behavior proceeds by way of the causes of phenomena—a prospect regarding which Avicenna is not optimistic in the *Ta'liqāt*, stating that in most cases we are incapable of grasping the causes of phenomena (Avicenna, 1984, 77). Rather, humans are generally capable only of discerning the apparent similarities and differences among things,

¹ Predicting the operations of the natural world is not limited merely to repeated observation and experiment—as empiricists claim in the modern era—but is obtained through the intellectual perception of the necessity inherent among natures.

while failing to achieve an understanding of what constitutes the essential components of phenomena (Avicenna, 1984, 77).

For this reason, in the *Physics of Al-Shifā'*, he states that in understanding the natural world, people treat that which occurs permanently or for the most part from a single cause as a necessary property, rather than treating it as a fleeting, accidental occurrence. He writes in the *Physics of Al-Shifā'*: "You know that people do not call that which comes into being permanently or for the most part from a single cause accidental or a matter of chance" (Avicenna, 2009, vol. 4, 63).

By accepting this point, he unexpectedly considers the effective practical method in particular sciences to be common sense rather than strict demonstrative intellect, regarding the empirical approach—in which clinical observation and experimentation serve as the effective elements—as the practical method for particular sciences. Consequently, he tempers the role of intellect and places the primary burden of a particular science such as medicine upon induction and experience alone, because access to complete causes is not always possible in medicine. Nevertheless, he still regards experience as "demonstration accompanied by opinion" rather than absolute certainty (Avicenna, 1994, 94).

In this way, in a particular science like medicine, even metaphysical assumptions can no longer account for the problems and challenges existing within the discipline. Instead of beginning with a universal syllogism grounded in universal metaphysical assumptions, he starts with experience to understand medical problems and conditions. Because of his emphasis on clinical trials for treating disease, he does not consider universal principles to be the starting point for explaining illnesses; to understand the nature of a disease and its treatment, he considers it necessary to examine patient conditions according to geography and various races:

We do not rule out the possibility that scammony in certain countries may be accompanied by a property and temperament, or lose a temperament and property, such that it no longer acts as a cholagogue. Our empirical criterion must be that the scammony known to us—the very scammony perceived by us—purges bile essentially or by nature, unless it encounters an obstacle (Avicenna, 1994, 93)¹.

By highlighting the repetition of conditions, geographical settings, and atmospheric factors at the time of conducting an experiment, Avicenna treats the universality and certainty obtained from empirical experience in medicine as limited. Thus, a particular science such as medicine—owing to the centrality of clinical experience and experimentation—can remain fluid and evolve over time free from theological and metaphysical assumptions, continually refining and

¹ Nasir al-Din al-Tusi adds temporal and human conditions to geographical settings as criteria for the validity of experience (Al-Tusi, 1976, 374). In this respect, remarkable affinities can be traced between Avicenna's conception and the modern scientific method.

adapting its methods to accommodate new cases rather than adhering to a dogmatic framework indifferent to temporal and spatial requirements¹.

In light of the preceding discussions, can Avicenna be considered a "secular" philosopher? If secularism is understood as the "methodological independence of science from theology"—meaning that science does not require reference to God or religious texts to explain natural phenomena and instead follows independent rational-empirical methods—then the answer is affirmative. This is because the natural scientist, in none of the stages of sensory observation, empirical repetition, the principle of absence, and rational analysis, needs to refer his knowledge to divine will or sacred scriptures. Simply by employing his intellect and senses and relying on the principle of "simultaneous presences and simultaneous absences," he can comprehend the intrinsic necessity governing natures, thereby discovering and formulating the laws of nature. This is precisely the methodological independence of science from theology, which can be termed a form of "methodological secularism." From this perspective, Avicenna can be regarded, alongside Aristotle and in opposition to the Ash'arites, as one of the founders of secular science (in this limited sense) in Islamic civilization.

The Epistemological Referral of the Principles of Particular Sciences to Philosophy

Although Avicenna separates science from theology, science ultimately remains subordinate to philosophy. Unlike in the modern era, where science is validated entirely within empirical logic, science in Avicenna's system is not freed from any logic transcending empirical science. To liberate himself from literalist and revelation-based interpretations, Avicenna was compelled to invent a complex metaphysical system—one far more intricate than any "simple theology." By distinguishing existence from essence and constructing a rational metaphysics, Avicenna rendered himself independent of "theological logic" (in the sense of appealing to revelation and tradition to justify cosmic truths). The price of this independence was the creation of a complex apparatus in which a network of hierarchical conceptual principles—such as existence, contingency, necessity, causality, potency and act—along with foundational logical principles like the law of non-contradiction and the impossibility of infinite regress and circularity, play a key role (Avicenna, 2009, vol. 1, 29–30). The methodological self-sufficiency of sciences does not mean that each science operates as "autonomous" and independent of everything, including

¹ This systematicity in the behavior of the quidditative world renders nature controllable by humans; that is, by knowing the fixed rules governing natures, humans can predict phenomena, influence them, and utilize them for their own ends. A physician, knowing that "scammony is naturally a cholagogue," can prescribe it with confidence to treat illness, and an engineer, aware of "the nature of forced motion," can calculate a projectile's path. If a physician knows that "scammony possesses a cholagogic nature" (necessarily, not merely as a divine habit), prescribing it allows him to "control" the disease. However, if this relationship were merely a divine habit with the possibility of its opposite occurring, the physician could never use the medicine with confidence. The practical control of quidditative nature became possible after he succeeded in theoretically delimiting nature within a necessary and fixed quidditative structure. Avicenna's theory laid the groundwork for the emergence of "applied science" in Islamic civilization: medicine, agriculture, architecture, and even early technologies took shape upon the conviction that nature possesses fixed rules that can be comprehended and harnessed.

other disciplines. Rather, to justify their claims, sciences must ultimately conceptualize their conceptual and propositional principles within a higher science (Avicenna, 1994, 219–220).

Avicenna maintains that particular sciences begin with principles and premises for which the particular sciences themselves offer no explanatory proof, treating them merely as posited, self-evident assumptions. In this regard, he believes in a series of foundational principles in the sciences, where some possess priority over others and serve as explanations for the principles assumed in lower sciences. Among these principles, some belong exclusively to a single science, while others are adopted across different sciences as shared principles and foundations. Several distinct sciences utilize the same primary principles or basic foundations for their arguments; for instance, mathematical sciences (geometry, arithmetic, astronomy, etc.) all share the basic principle that "things equal to a third thing are equal to one another." This is a logical-mathematical principle used by all branches of mathematics in their demonstrations, even though each branch possesses its own specific subject matter and problems (Avicenna, 1994, 216).

According to Avicenna, the principles and premises present in particular sciences must either be self-evident in themselves or lead to principles that possess self-evidence in themselves, thereby justifying the evidence of the principles in lower sciences (Avicenna, 2009, vol. 1, 30)¹. Particular sciences lack such self-manifesting conceptual capabilities within themselves; hence, the ultimate chain of principles and premises of particular sciences leads to First Philosophy (the Highest Science), which possesses the capacity to provide the self-evident principles capable of serving as the foundation for all human knowledge and justifying them. He writes in the *Demonstration of Al-Shifā'*:

Those principles that are not self-evident in themselves are proven in another science—in the Highest Science. As for the principles of the Highest Science, under which other sciences fall, most of them are self-evident in themselves, and a few of them are taken from the particular sciences situated beneath that Highest Science in the manner previously described, though the number of such principles is negligible (Avicenna, 1994, 247).

What Avicenna means by the Highest Science—in which all assumed principles and foundations ultimately obtain their explanation—is not theology, but philosophy.

¹ In natural science, certain principles serve as its foundations and obtain their explanation in the Highest Science; for example: 1- The principle that "every motion requires a cause of motion" is taken by the natural scientist as a granted premise. 2- The principle that "prime matter lacks form but possesses the capacity to receive various forms" is assumed by the natural scientist to explain substantial transformations. 3- "The impossibility of an infinite regress in natural causes." 4- "Every natural body is a composite of matter and form." These principles are "posited assumptions" in natural science, not because they are unprovable, but in the sense that the natural scientist qua natural scientist does not need to prove them and can borrow them from a higher science (First Philosophy), whereas primary self-evident principles (such as the law of non-contradiction) are never proven, but can only be defended.

And since we assumed that some principles of the sciences are not self-evident in themselves and must be explained in another science—which is either like this particular science or more general than it, necessarily leading to the most general of sciences—it is obligatory that the principles of other sciences be proven in First Philosophy (Avicenna, 1994, 213).

However, the fundamental point to note is that by referring justification to within a network of sciences, the ground is prepared for the independence of the sciences from any ontological factor such as divine will and habit (as present in the Ash‘arite view). That is, it is no longer necessary to step outside the realm of science to justify the logical system of the sciences by taking ontological considerations into account. In fact, because sciences possess a hierarchical connection that ultimately leads to philosophy as the Highest Science and the mother of sciences, they acquire their own specific domain, requiring only their internal logical order and conceptual hierarchy for the justification of scientific structure, rather than something external like divine will and habit. Therefore, the indebtedness of particular sciences to philosophy should not be mistaken for an error on Avicenna's part that once again restricts science to an element outside itself; rather, it is this very indebtedness of particular sciences to philosophy that ultimately leads to their methodological and epistemological independence, because First Philosophy, with its primary self-evident principles, limits the chain of justification to its internal order, freeing it from infinite regress or reference to something outside knowledge.

Conclusion

From what has been discussed, it becomes clear that because Avicenna—unlike the Ash‘arites—relates the effects present in the natural world to the essence and intrinsic realities of natural things, treating the diversity of effects in nature as arising from the material and formal characteristics of essence itself, he approaches the modern conception of science, whose fundamental feature is the predictability and calculability of nature.

The Stoic and Ash‘arite views, because they do not consider the effects present in the natural world to be immediately related to natural subjects, link the connection of effects to natures through divine will. Consequently, they do not attribute the appearance of accidents and effects in natural substances to an internal necessary law, but rather assign effects to natures by introducing God's continuous will. Under this theory, the law-governed nature of the universe is invalidated, and it is divine habit that accounts for the conjunction between effects and nature. This conception impacts our knowledge of the natural world, overshadowing our independence in understanding nature and its effects—which is the mission of natural science. That is, we cannot comprehend nature autonomously, and penetrating it becomes possible only by grasping divine will and habit in the connection between effects and natures.

By contrast, Avicenna removes the distance between effects and nature that was previously filled by divine will, enabling humans through rational experience to discover this connection

and determine empirical science. To reach this juncture, he executes a grand revolution in metaphysics to prepare the ground for the independence of science. To this end, he establishes a distinction between existence and essence (*quiddity*), and by attaching divine enactment to existence, he removes essence from beneath divine will.

The distinction between existence and essence in Avicenna's system is not merely a metaphysical theory, but serves as the bedrock for an epistemological and methodological blueprint for empirical science; for this distinction rescues the natural world from randomness and arbitrariness, rendering it law-governed and controllable, while opening the way for human rational penetration into the order of nature. Thus, Avicenna both guarantees the lawfulness of the world and provides the possibility for certainty-based knowledge of nature. Subsequently, he renders the logic of particular sciences analyzable and justifiable within a philosophical horizon, granting philosophy a foundational role in explaining the possibility, limits, and validity of particular sciences. Overall, this trajectory demonstrates that the distinction between existence and essence was not merely a metaphysical debate, but a theoretical foundation for the formation of independent science and the transition to calculable rationality in the history of thought.

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