Search for a Physics Perspective in the Vaiśeṣika Darśana

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Abstract

From the earliest Vedic period, the various schools of Bhāratīya Darśana have rigorously examined the nature of matter and its intrinsic properties, contributing to a rich philosophical and proto-scientific tradition. Among these, the Vaiśeṣika Darśana stands out for its systematic approach to the analysis of physical reality. This paper explores the foundational concepts of the Vaiśeṣika system, focusing on its treatment of matter, space, time, motion, and causality. We highlight the structural logic underlying its metaphysical assertions and consider its potential relevance to a modern scientific framework.

Introduction

Physics may be defined as the systematic study of the fundamental principles governing motion and transformations in matter within the frameworks of space and time. In pursuit of this understanding, the discipline has developed rigorous conceptual and mathematical models, grounded in empirical observation and logical inference, to describe interactions among physical entities and elucidate the behaviour of the universe at multiple scales. A paradigmatic example is Newton's formulation of the laws of motion, wherein force is conceptualized as the causal agent effecting a change in the state of motion of an object. These principles, articulated through the mathematical formalism of calculus, successfully form a foundational component of classical physics. Nevertheless, experimental anomalies catalyzed two transformative revolutions in physics: the Theory of Relativity and Quantum Theory, which have altered the epistemological and ontological assumptions underlying physical theory.

Historically, physics stands among the most ancient scientific disciplines, emerging with early astronomical investigations. Contributions to this proto-scientific tradition can be traced to various ancient civilizations, including those of Bhārata (India), Greece, Egypt (Misr), Mesopotamia, and China. Notably, the intellectual tradition of ancient Bhārata manifests a distinctive scientific ethos laying the foundations of the concepts (Bose, Sen, &

Subbarayappa, 1971; Chauhan, 2023; Dongre, 1990; Jaggi, 1986; Kamble, 2022; Kumar, 2019; Parameswaran, 1998; Sabareesh, 2022; Sarma, 1972; Satyaprakash, 1965; Seal, 1915; Singh, 2017; Verma, 1993, 1994) on which present-day science is based. Textual evidence reveals that early Hindu scholars were deeply engaged in systematic inquiry (*Anusandhana*), guided by the triad of *Dṛṣṭam* (observation), *Anumāna* (inference), and *Āpta-Vacana* (authentic testimony), as can be seen in the Sāṃkhya Kārikā (4) (Virupakshananda, 1995):

दृष्टमनुमानमाप्तवचनं च। सर्वप्रमाणसिद्धत्वात्।
त्रिविधं प्रमाणमिष्टं प्रमेयसिद्धिः प्रमाणाद्धि ॥

[Among all sources of valid knowledge, preference should be given to three: Observation, Inference, and Authentic Testimony.]

This work aims to present, in an objective manner, select elements of ancient Bhāratīya contributions to physics, particularly through the lens of the Vaiśeṣika Darśana. Our focus is primarily on the structural and functional aspects of matter as conceived in the Vaiśeṣika system, excluding metaphysical discussions on consciousness. It concerns with categorizing and analyzing the constituents of reality—namely Substance, Attributes, Motion, Universals, Particulars, and Inherence. The Vaiśeṣika ontology posits that all gross objects, situated within the continuous substratum of Space and Time, are composed of indivisible atoms (ultimate constituents) of the four classical elements— Earth, Water, Air, and Fire. The fifth element, Ether, functions as an all-pervading continuum that exists universally. Among the most consequential philosophical contributions of the Vaiśeṣika Darśana is its detailed pioneering articulation of the principle of causality (Svechnikov, 1971), establishing a continuous causal nexus that underlies all universal processes. The progress of physical science is predicated upon an implicit commitment to this law of causation. There exists a striking congruence between the nature of inquiry in Vaiśeṣika Darśana and the methodological aspirations of modern physics. Both seek to address fundamental ontological and epistemological questions such as: “What is the nature of reality?” and “How does it operate?”

Furthermore, ancient Bharat had already evolved into a vibrant intellectual hub, nurturing a scientific culture across a wide range of disciplines (Bose, Sen, & Subbarayappa, 1971; Chauhan, 2023; Dongre, 1990; Jaggi, 1986; Kamble, 2022; Kumar, 2019; Parameswaran, 1998; Sabareesh, 2022; Sarma, 1972; Satyaprakash, 1965; Seal, 1915; Singh, 2017; Verma, 1993, 1994). Universities such as Takṣaśilā, Nālandā, Valabhi, Vikramaśila, and Ujjayini

were globally renowned centers of higher learning (Apte, 1961; Singh, 2017; Mookerjee, 1947/1960). Mathematical astronomy, in particular, attained a sophisticated level of development through the seminal works of scholars like *Ā*ryabhata, Brahmagupta, and Varāhamihira (Bose, Sen, & Subbarayappa, 1971; Jaggi, 1986) The culmination of this tradition can be seen in *Siddhānta Shiromaṇi,* authored by Bhāskara II circa 1150 CE, where advanced mathematical techniques—such as the use of infinitesimals and the concept of *Tātkālik Gati* (instantaneous velocity)—were employed to model planetary motion with remarkable precision (Bose, Sen, & Subbarayappa, 1971). Subsequently, the Kerala School of Mathematics and Astronomy made pioneering advances in the theory and application of calculus (Parameswaran, 1998; Sarma, 1972), several centuries prior to its formalization by Newton and Leibniz.

Sources of Bhāratīya Darśana

The origins of various theories of matter in Bhāratīya Darśana (Indian philosophy) can be traced to the earliest layers of Vedic literature, particularly the Ṛgveda (Saraswati & Vidyalankar, 1977), and were later elaborated in the Upaniṣads (Joshi, Bimali, & Trivedi, 2016). These inquiries were formalized in the classical schools of Bhāratīya Darśana. These schools are traditionally classified into two broad categories: the Vedic (orthodox) and the Avedic (heterodox) systems. The six principal Vedic Darśanas —Nyāya, Vaiśeṣika, Sāṃkhya, Yoga, Mīmāṃsā, and Vedānta—were well-established by the time of the Buddha (circa 6th century BCE) (Radhakrishnan, 1951). The major Avedic schools include Jaina, Buddhist, and Cārvāka traditions. Despite their philosophical differences, these traditions share a common concern with understanding the nature of matter and its relation to motion, space, time, and transformation occurring causality (Kārya-Kāraṇa-Vāda) —core components of any physical worldview. This notion underpins much of classical Indian logic and metaphysics and anticipates modern scientific paradigms that rest upon causal determinism. These schools continued to evolve through śastrartha (scholastic debates), which were intrinsic to the education of ancient and medieval Bhārata (Singh, 2017). The longevity and richness of this tradition are evident in the extensive corpus of Bhāṣyas (commentaries) written on their foundational texts.

The spectrum of theories on matter (Bose, Sen, & Subbarayappa, 1971; Satyaprakash, 1965; Verma, 1993, 1994) in Bhāratīya Darśana spans from atomistic interpretations, positing that all gross objects are composed of subtle and indivisible Paramāṇus (atoms) of few of

elements as those found in the Vaiśeṣika Darśana, to cosmological dualism of Prakṛti (matter) and Puruṣa (consciousness) emphasizing the evolutionary unfolding of the cosmos in Sāṃkhya, and culminates in the dissolution of all plurality into a non-dual Absolute Unity (Brahmaṇ), the ultimate substratum of existence, as propounded in Vedānta. We, however, focus exclusively on the Vaiśeṣika Darśana, highlighting its scientific relevance and philosophical rigor in conceptualizing matter and motion.

Matter and the Universe in Vaiśeṣika Darśana

The conceptualization of fundamental elements of matter, alluded to in several *Upaniṣads*, eventually culminated in the doctrine of five basic elements. A comprehensive and systematic exposition of these ideas is found in the Vaiśeṣika Darśana, attributed to the sage Kaṇāda, who is believed to have lived well before the 7th century BCE. Often regarded as the first proponent of Realism in Bhāratīya Darśana, Kaṇāda authored the Vaiśeṣika Sūtras (VS) (Arya, 2021; Chakrabarty, 2003), wherein he developed a detailed physical and metaphysical framework for the analysis of the nature of physical substance (*Dravya*) and its associated properties, grounded in realism and atomism (Arya, 2021; Bose, Sen, & Subbarayappa, 1971; Chakrabarty, 2003; Mishra, 1987; Satyaprakash, 1965).

Substance is the foundational category which acts as the substratum for all other realities, namely: quality, motion, generality, particularity, inherence, and later non-existence. Additionally, the Vaiśeṣika Sūtras explore core physical concepts such as primary elements, space, time, and causality. The Vaiśeṣika school offers a materialist and pluralistic ontology wherein all macroscopic objects are composed of combinations of indivisible, eternal atoms (*Paramāṇu*[10]) of the elements. Notably, the Vaiśeṣika framework includes rudimentary principles of mechanics, material interaction, and chemical combination, reflecting an advanced understanding of physical processes for its time.

These insights collectively form a remarkably sophisticated framework akin to the foundational principles of physics, anticipating the atomistic and causal reasoning long before these principles emerged later in modern science.

Over the centuries, several commentaries (*Bhāṣya*) were composed to elucidate and expand upon Kaṇāda's *Sūtras*. Among these, the most influential is the Praśastapāda Bhāṣya (PB) written in 5th century CE (Jha, 1916/1982), which serves as a cornerstone of the Vaiśeṣika

[10] Actually, the word `*Anu'* has been used in the *Vaisheshika Sutras,* however, it conveys the popular meaning of ultimate fundamental constituent particles (*paramanu*).

thought.

In the following subsections, we shall delve deeper into the Vaiśeṣika Darśana, highlighting its contributions to understand matter and universe.

Objective Universe in Vaiśeṣika Darśana

The Vaiśeṣika Darśana, as propounded by Sage Kaṇāda, presents a distinctly realist and pluralist metaphysical view of the universe. Central to this system is the belief in an objective, external universe (*bāhya-jagat*) that exists independently of human perception and is eternal in nature.

i. Eternality of the Universe

Kaṇāda affirms the self-existent and uncreated nature of the material world:

सदकारणवन्नित्यम् (VS 4.1.1)

[Existence, the essence of material reality, has no cause. It exists of its own accord and is eternal.]

This aphorism underscores the Vaiśeṣika commitment to ontological realism, wherein *sat* (existence) is not a product of creation but is intrinsic to the fabric of reality.

ii. Primacy of Substance (Dravya)

The *Vaiśeṣika Sūtras* systematically investigate six categories (*Padārthas*), which serve as the fundamental building blocks of his metaphysical framework. These include:

- *Dravya* (Substance)
- *Guṇa* (Quality)
- *Karma* (Motion)
- *Sāmānya* (Universality)
- *Viśeṣa* (Particularity)
- *Samavāya* (Inherence)

धर्मविशेषप्रसूतात् द्रव्यगुणकर्मसामान्यविशेषसमवायानां पदार्थानां साधर्म्यवैधर्म्याभ्यां तत्त्वज्ञानान्निःश्रेयसम् (VS 1.1.4)

[The highest good is attained through the comprehensive knowledge (*tattva-jñāna*) of substances, their qualities and motions, and of the general, particular, and inherent properties among them. This knowledge is rooted in *Dharma* (universal order)]

Substances are thus the locus of reality; the remaining categories cannot exist independently of them. Knowledge of these categories constitutes *tattva-jñāna*, or the understanding of true reality.

iii. Ontological Realism

The Vaiśeṣika Darśana identifies all *padārthas* as existing (*sat*), meaning they possess independent and positive existence. Their apprehension through valid means of knowledge (*pramāṇas*) leads to a correct understanding of the universe.

Types of Substances: Eternal and Non-Eternal

Vaiśeṣika distinguishes between two types of substances:

- **Eternal** (*Nitya*): These include *Paramāṇu* (atoms), *Ākāśa* (ether), *Kāla* (time), *Dik* (space), and *Ātmā* (self).
- **Non-Eternal** (*Anitya*): These refer to compound substances (***mahābhūta***), which are subject to generation and decay.

The eternal substances are further classified as:

- **Paramāṇvic** (atomic and indivisible), and
- **Vibhu** (ubiquitous, all-pervasive, such as *Ākāśa* and *Ātmā*).

Formation of Cosmos (*Brahmāṇḍa*)

The cosmic process unfolds through a metaphysical act of will (*saṅkalpa*) and the aggregation of atoms culminating in the formation of the *Brahmāṇḍa* (cosmic egg).

Classification of Creation

Creation (*sṛṣṭi*) is categorized as twofold:

तत्र शरीरं द्विविधं योनिजमयोनिजञ्च (VS 4.2.6)

[Bodies are of two types: those arising from sexual reproduction (*yonija*) and those arising asexually (*ayonija*).]

This classification includes divine, natural, and spontaneous modes of creation, reflecting a holistic cosmology.

Cyclical Time and Destruction

The Vaiśeṣika Darśana envisions a cyclical cosmology, wherein all compound entities ultimately disintegrate into their constituent atoms. This disintegration is not annihilation but reduction to primordial form (*paramāṇus*). The *Kalpa* (cosmic rest) marks the interval of dissolution, followed by a new cycle of creation—a process without beginning or end (*anādi-ananta*).

Attributes (*Guṇas*) and Their Substratum

Attributes do not exist independently; they inhere in substances and are classified systematically. Originally, Kaṇāda identified seventeen qualities (*guṇas*), such as:

रूपरसगन्धस्पर्शाः संख्याःपरिमाणानि-पृथक्त्वं संयोगविभागौ
परत्वापरत्वे बुद्धयः सुखदुःखे इच्छा-द्वेषौ प्रयत्नाश्च गुणाः (VS 1.1.6)

[Form, taste, smell, touch, number, magnitude, distinctness, conjunction, disjunction, posteriority, priority, cognition, pleasure, pain, desire, aversion, and volition—these are the seventeen qualities.]

Praśastapāda, in his *Padārthadharmasaṅgraha* (Jha, 1916/1982), augmented this list by adding seven more attributes, bringing the total to twenty-four. These encompass both physical and psychological dimensions, thus extending the reach of Vaiśeṣika analysis into the realm of the knower (*jñātā*) as well as the known (*jñeya*).

Fundamental Nine Substances (*Dravyas*) and Their Properties

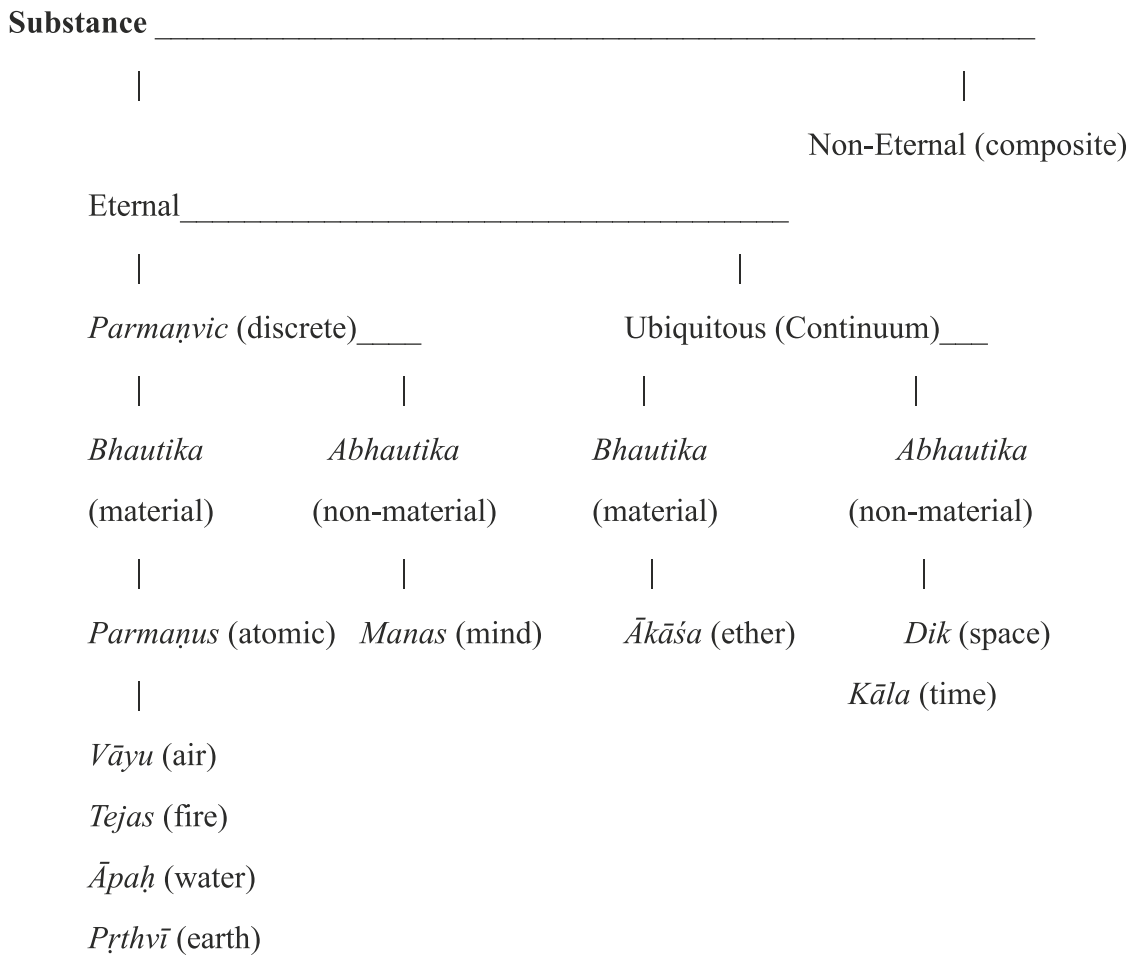
The Vaiśeṣika darshan articulates a comprehensive ontology consisting of nine fundamental categories of substance (*dravya*) (Table 1.). These are enumerated as:

पृथिव्यापस्तेजो वायुराकाशं कालो दिगात्मा मन इति द्रव्याणि (VS 1.1.5)

[*Pṛthvī* (earth), *Āpaḥ* (water), *Tejas* (fire), *Vāyu* (air), *Ākāśa* (ether), *Dik* (space), *Kāla* (time), *Manas* (mind), and *Ātmā* (Self) are the nine substances.]

These substances form the ontological foundation of all physical, mental, and metaphysical phenomena in the universe. The first five—*Pṛthvī* (earth), *Āpaḥ* (water), *Tejas* (fire), *Vāyu* (air), and *Ākāśa* (ether) —are designated as *bhautika* (material), while the remaining four—*Dik* (space), *Kāla* (time), *Manas* (mind), and *Ātmā* (Self) —are considered *abhautika* (non-material).

Table 1: Basic Elements in Vaiśeṣika Darśana (*excluding Self*)



The Role of Self (*Ātmā*) and Mind (*Manas*)

The Self (*Ātmā*) is described as eternal, omnipresent, and motionless. It is the locus of consciousness, capable of knowledge, desire, pleasure, and pain. Mind (*Manas*), although atomic and non-eternal, functions as the internal instrument of perception and cognition. Together, Ātmā and Manas facilitate the sense of individuality (*ahaṃkāra*) and self-awareness. While both are foundational in Vaiśeṣika psychology and metaphysics, their full treatment lies beyond the present discussion.

Pañcabhūta Doctrine and Sensory Correlation

The first five great elements, —*Pṛthvī, Āpaḥ, Tejas, Vāyu*, and *Ākāśa*—constitute the *Pañcabhūtas* Doctrine, which is rooted in the correlation between sensory faculties and the distinctive attributes of elements, as given below:

- *Pṛthvī* – smell (*gandha*)
- *Āpaḥ* – taste (*rasa*)
- *Tejas* – sight (*rūpa*)
- *Vāyu* – touch (*sparśa*)
- *Ākāśa* – sound (*śabda*)

This elemental schema formed cosmological and physiological theories across Bhāratīya traditions, and remained influential in the world until the 17th century.

Properties and Characteristics of the Fundamental Elements

Each *dravya* is defined not only by its intrinsic nature (*svarūpa*) but also by its properties (*guṇas*), which are inseparably located in the substance. Each element is distinguished by a unique set of *guṇas* and possesses five shared properties: number, dimension, distinction, conjunction, and disjunction. The individual characteristics of each substance are summarized below:

i Earth (*Pṛthvī*)

रूपरसगन्धस्पर्शवती पृथिवी (VS 2.1.1)

[*Pṛthvī* has the qualities of form, taste, smell, colour, and touch.]

Smell (*gandha*) is its distinctive attribute, supported by:

व्यवस्थितः पृथिव्यां गन्धः (VS 2.2.2)

[Odour is inherently established in Earth.]

Pṛthvī is naturally solid but can attain fluidity when acted upon by heat, demonstrating the transformative interplay between the elements.

ii. Water (*Āpaḥ*)

रूपरसस्पर्शवत्य आपो द्रवाः स्निग्धाः (VS 2.1.2)

[*Āpaḥ* possesses form, colour, taste, touch, fluidity, and viscosity (unctuousness).]

Taste (*rasa*) is its defining property. Water serves as a cohesive and nutritive medium within the Vaiśeṣika framework.

iii. Fire (*Tejas*)

तेजो रूपस्पर्शवत् (VS 2.1.3)

[*Tejas* possesses form, colour, and touch.]

The distinctive attribute of *Tejas* is colour (*rūpa*), and it is regarded as the agent of transformation and chemical change, essential in physical processes.

iv. Air (*Vāyu*)

स्पर्शवान् वायुः (VS 2.1.4)

[*Vāyu* possesses the quality of touch.]

न च दृष्टानां स्पर्श इत्यदृष्टलिङ्गो वायुः (VS 2.1.10)

[*Vāyu* is imperceptible to the eyes and only known through touch.]

Vāyu is characterized by oblique motion (*tiryak-gati*) and constant activity (*satat-gati*), and among all elements, it is considered to have the fastest movement. Though generally invisible, its effects are perceptible through motion and pressure.

v. Ether (*Ākāśa*)

Unlike the preceding elements, *Ākāśa* is imperceptible and devoid of the commonly known qualities:

त आकाशे न विद्यन्ते (VS 2.1.5)

[These qualities do not exist in *Ākāśa*.]

However, it possesses one unique attribute:

परिशेषाल्लिङ्गमाकाशस्य (VS 2.1.27)

[Sound is the specific quality of *Ākāśa*.]

This interpretation of *Ākāśa* should not be conflated with Aristotelian Ether (Satyaprakash, 1965). In Vaiśeṣika, *Ākāśa* is conceptualized as the substratum of sound, space, and interaction, and has been intriguingly compared to the quantum vacuum in modern theoretical physics.

vi. Space (*Dik*)

इत इदमिति यतस्तद्दिश्यं लिङ्गम् (VS 2.2.10)

['Here' and 'this' are the indicative characteristics of *Dik*.]

तत्त्वम्भावेन (VS 2.2.12)

[The unity of Space is understood by its unitary existence.]

Space (*Dik*) is eternal, super sensible, and provides the basis for spatial relations. Unlike Ākāśa, it is not associated with any particular sensory quality but is conceptually necessary for localization and orientation.

vii. Time (*Kāla*)

अपरस्मिन्नपरं युगपत् चिरं क्षिप्रमिति काललिङ्गानि (VS 2.2.6)

[Later, posterior, simultaneity, and speed—these indicate *Kāla*.]

Time *(Kāla)* is a non-material continuum that enables the sequencing of events and the processes of creation, duration, and destruction. It is divided experientially into past, present, and future, and functions as an instrumental cause (*nimitta-kāraṇa*) for all changes.

viii. Continuum of the Eternal Background: *Ākāśa, Dik,* and *Kāla*

These three—*Ākāśa, Dik,* and *Kāla*—are considered eternal and all-pervasive, forming the metaphysical continuum, ontological background of cosmic processes, within which all transformations occur.

विभ्वान्महाना काशस्तथा चात्मा (VS 7.1.22)

[*Ākāśa* and *Ātmā* (self) are called all-pervasive due to their infinite extension.]

Their objective reality and non-perceptibility highlight the philosophical subtlety of Vaiśeṣika ontology, which extends beyond empirical materialism to encompass abstract and foundational metaphysical entities.

3.3 *Paramāṇuvāda* (Atomism)

Material objects are composed of indivisible and eternal atoms (*paramāṇus*), each associated with one of the four classical elements: *Pṛthvī* (earth), *Āpaḥ* (water), *Tejas* (fire), and *Vāyu* (air). These atoms are the permanent substratum of all phenomenal reality. The Vaiśeṣika Darśana developed a highly systematic and logically coherent theory of atomism *(paramāṇuvāda).* This theory not only accounts for the composition of matter but also integrates a metaphysical account of causality and transformation.

i. Nature of the *Paramāṇu*

The *paramāṇu* is posited as the smallest, indivisible, and imperceptible unit of matter. It is eternal, indestructible, and non-composite, yet it serves as the fundamental building block of the entire material cosmos.

अणुसंयोगस्त्वप्रतिषिद्धः (VS 4.2.5)

[Despite the absence of direct perception, the conjunction of atoms is a valid inference.]

ii. Form, Specificity, and Classification of Atoms

Each atom is said to possess *parimaṇḍala rūpa*—a spherical form—and *viśeṣa*, a unique specific property that distinguishes it from all other atoms. This doctrine of *viśeṣa* (particularity) is foundational, as it prevents the logical collapse of metaphysical identity across apparently similar entities.

Vaiśeṣika classifies *paramāṇus* according to their distinctive elemental attributes:

- *Pṛthvī-paramāṇu*: possesses *gandha* (odour)
- *Āpaḥ -paramāṇu*: possesses *rasa* (taste)
- *Tejas-paramāṇu*: possesses *rūpa* (form/colour)
- *Vāyu-paramāṇu*: possesses *sparśa* (touch)

Each *guṇa* (quality) is eternally inherent in its respective atom. Importantly, *Ākāśa* (ether) is not composed of atoms but is all-pervading.

iii. Atomic Composition and Compound Formation

Atoms are in eternal vibratory motion (*nityagamana*), a doctrine supported by both Kaṇāda and Praśastapāda. Through motion, two homogeneous atoms (of the same element) combine to form a dyad (*dvyaṇuka*), which, like the atom, remains imperceptible.

Three dyads unite to form a triad *(trasareṇu),* which is perceptible and is often compared in classical texts to the dust motes visible in a sunbeam. Numerically speaking, size of a *trasarenu* has been estimated to be 349525th part of an inch (Seal, 1915).

Successively larger aggregates are formed through further combinations[11]:

- *Caturṇuka* (tetrad) – formed from four dyads.
- Beyond triads, these compounds become increasingly perceptible and constitute gross material objects.

3.4 *Ārambhavāda* (Doctrine of Causality)

Vaiśeṣika espouses a rigorous theory of causality known as *Ārambhavāda*, or the theory of novel creation. This is associated with the broader Nyāya-Vaiśeṣika stance of *Asatkāryavāda* (Satyaprakash, 1965)—the view that the effect does not pre-exist in the cause.

कारणाभावात्कार्याभावः (VS 1.2.1)

[In the absence of the cause, the effect is also absent.]

न तु कार्याभावात् कारणाभावः (VS 1.2.2)

[But not vice versa; the absence of the effect does not imply the absence of the cause.]

Key Features of Vaiśeṣika Causality

i. Types of Causes

Kaṇāda and Praśastapāda classify causality into three types:

1. *Samavāyī-kāraṇa* (inherent/material cause) – e.g., atoms forming a pot.
2. *Asamavāyī-kāraṇa* (non-inherent/substrate cause) – e.g., colour of a pot depending on clay.

[11] Many concepts of Vaiśeṣika Darśana, like dyad, triad, tetrad and *Adṛṣṭa,* do not have their parallels in the Greek atomic views (Bose, Sen, & Subbarayappa, 1971), which indicate their independent origin, and the Vaiśeṣika atomism also has its claim of antiquity (Satyaprakash, 1965).

3. *Nimitta-kāraṇa* (instrumental/efficient cause) – e.g., the potter in pot-making.

कारणमिति द्रव्ये कार्यसमवायात् (VS 10.2.1)

[Inherence pertains to cause because of its substantiality.]

क्रियागुणवत् समवायिकारण मिति द्रव्य लक्षणम् (VS 1.1.15)

[The characteristics of substance include motion and qualities, and being the cause of inherence of qualities and motions.]

नित्येष्वभावादनित्येषु भावात्कारणे कालाख्येति (VS 2.2.9)

[The name 'Time' is applied to an efficient cause due to its lack of existence among the eternals and due to its existence among the non-eternals.]

There is an absolute difference between the cause and its effect though there is a continuity between them. The cause in each case brings about the effect but is immediately absorbed into the effect, which in turn plays the function of another cause to continue the process.

ii. Causal Chain and Conservation

All the universal processes respect the principle of causality. The *paramanus* are the material cause for the formation of *dvyanukas,* which in turn is the effect. Similarly, *dvyanukas* act as the cause of the formation of a *trasarenu*, and so on. Causation is viewed as a transformative continuity: the material cause becomes the effect without annihilation of substance.

न द्रव्यं कार्यं कारणञ्च वधति (VS 1.1.12)

[No substance destroys its own effect and cause]

Vaiśeṣika thus anticipates a conservation of matter view: the number of *paramāṇus* in an effect equals those in the cause, although their arrangement changes.

iii. Role of *Adṛṣṭa* as Divine Will

Atoms, by themselves, do not initiate conjunction, else they would be involved in continuous creation. Their combination is attributed to *Adṛṣṭa* (Divine Will), an unseen force grounded in the doctrine of *karman* (moral causality). This introduces a theistic dimension where *Īśvara* (God) or cosmic law initiates motion in atoms at the beginning of a cycle.

iv. Secondary Causal Properties

- *Gurutva* (gravity): downward motion of *Āpaḥ* (water)
- *Dravatva* (fluidity): natural tendency of liquids to flow.
- *Sneha* (viscosity): causes cohesion.
- *Saṅkoca-pratyānāma* (elasticity): return to original shape after deformation.

For example,

अपां संयोगाभावे गुरुत्वात् पतनम् (VS 5.2.3)

[Among *Apah*, fall takes place due to *gurutva* in the absence of any conjunction with any other object.]

v. Concept of *Abhāva* (Non-existence)

Later Vaiśeṣika school introduced *Abhāva* as a category. Non-existence is considered an object of cognition and is inferred under certain logical conditions (*Abhāvavāda*) (Jha, 1916/1982). Its distinguishing types are:

- *Prāgabhāva:* prior non-existence
- *Pradhvaṁsābhāva:* posterior non-existence
- *Atyantābhāva:* absolute non-existence
- *Anyonyābhāva:* mutual non-existence
-

3.5 Vaiśeṣika Views on Motion

Motion (*karma*) holds a central place in Bhāratīya Darśana, particularly in the Vaiśeṣika system, where it is regarded as a necessary condition for both the creation and dissolution of the cosmos. The *Vaiśeṣika Sūtras* of Kaṇāda offer a sophisticated proto-mechanical framework, further expanded upon in classical commentaries such as the *Praśastapāda Bhāṣya* and *Nyāya-Kandalī* by Śrīdhara.

i. Classification of Motion *(Karma)*

Motion is considered a *guṇa* (quality) of *dravya* (substance) and is inherent in it. According to *Vaiśeṣika Sūtra*, there are five types of motion:

उत्क्षेपणमवक्षेपणमाकुञ्चनं प्रसारणं गमनमिति कर्माणि (VS 1.1.7)

[Upward motion (*utkṣepaṇa*), downward motion (*apakṣepaṇa*), contraction (*ākuñcana*), expansion (*prasāraṇa*), and general motion (*gamana*) — these are the five types of motion.]

This typology reflects the Vaiśeṣika understanding of mechanical transformation in all material bodies.

ii. *Adṛṣṭa* as Unknown Cause

Certain motions are not attributable to visible or direct causes. Such phenomena—including the initial motion of atoms (*paramāṇu*), the behaviour of air *(vāyu),* or the attraction between iron and magnet—are attributed to *Adṛṣṭa*, an unseen force.

अग्नेरूर्ध्वज्वलनं वायोस्तिर्यक् पवनमणूनां मनसश्चाद्यं कर्मा दृष्ट कारितम् (VS 5.2.13)

[The upward rising of fire, sideward motion of air, and initial motion of atoms and the mind are due to *Adṛṣṭa* (the unseen cause).]

Praśastapāda (Jha, 1916/1982) affirms that *Adṛṣṭa* initiates motion when empirical causes are absent, especially at the beginning of a cosmic cycle (*Adṛṣṭakāraṇatva*).

iii. *Vega* (Momentum) and *Nodana* (Impelling Force)

The concept of *vega* in Vaiśeṣika approximates the idea of momentum. It is both the result and cause of motion. Vega is generated by:

- *Nodana* (impelling force),
- *Abhighāta* (impact), and
- *Saṃyukta-saṃyoga* (conjunction with a moving body).

नोदनाभिघातात् संयुक्तसंयोगाच्च पृथिव्यां कर्म (VS 5.2.1)

[In solids, motion is caused by impact or by conjunction with a moving body.]

iv. *Samskāra* (Impetus) and the Principle of Inertia

Vaiśeṣika recognizes *samskāra*—a form of residual momentum—as a force that maintains an object in motion even after the initial force has ceased. This is analogous to the impetus theory, a forerunner of the modern principle of inertia.

नोदनविशेषाद्दसनविशेषः (VS 5.1.10)

[Increased velocity results from increased impelling force.]

अभिघातान्मुसलसंयोगाद्धस्ते कर्म (VS 5.1.5)

[Due to the impact resulting from conjunction with a stone, the hand acquires motion.]

कार्यविरोधि कर्म (VS 1.1.14)

[Motion is opposed by counter-motion; perpetual motion is not possible.] This dual causal model emphasizes the reciprocal causality of motion, a notion parallel to Newton's third law of action-reaction.

v. Formulation of the Kaṇāda Laws of Motion

N.G. Dongre (Dongre, 1990) reconstructs the three fundamental laws of motion from *Praśastapāda's Padārtha-Dharma-Saṅgraha* (Jha, 1916/1982). By breaking the following *shloka*:

वेगो मूर्तिमत्सु पञ्चसु द्रव्येषु निमित्तविशेषापेक्षात् कर्मणो जायते नियतदिक्क्रियाप्रबन्धहेतुः स्पर्शवद्द्रव्यसंयोगविशेषात्विरोधि क्वचित्कारणगुणपूर्वक्रमेणोत्पद्यते

into three parts,

अत्र – वेगः निमित्त-विशेषात् कर्मणो जायते ।
वेगः अपेक्षात् कर्मणो जायते नियत दिक्-क्रिया-प्रबन्ध हेतुः ।
वेगः संयोगविशेषविरोधि, क्वचित्कारणगुणपूर्वक्रमेणोत्पद्यते

he obtains the following laws of motion (Dongre, 1990):

1. Force is the specific cause of motion.
2. Force is proportional to the motion produced and acts in the same direction.
3. Force counteracts material conjunction and can trigger secondary motions in sequence.

These correspond structurally to Newton's laws, centuries prior to their European articulation.

vi. Early Impetus Theory and Later Developments

Nyāya-Kandalī offers illustrative examples: a javelin thrown or an arrow released from a bow does not fall immediately because the *samskāra* (impetus) resists gravity (Seal, 1915), akin to Galileo's inertia and Buridan's impetus theory.

"The motion of the arrow continues even after it leaves the bowstring because of the latent force imparted by the archer." (*Nyāya-Kandalī*, *Karma-prakaraṇa*)

Historically, the impetus theory appeared in Western philosophy only in the 6th century CE with John Philoponus, and gained attraction in the 14th century. However, the Vaiśeṣika Sutras (circa 7th century BCE) and Praśastapāda Bhāṣya (circa 5th century CE) precede these accounts, marking a significant contribution of Bhāratīya thought to classical mechanics.

3.6 Inter-*Darśanic* Resonances

Other Bhāratīya schools, broadly agreeing with the Vaiśeṣika views, also address issues of matter and motion by introducing new features:

- **Nyāya**: accepts Vaiśeṣika physics, adding epistemological features.
- **Mīmāṃsā**: addresses motion in ritual and cognition introducing concept of Śakti (energy).
- **Jaina**: introduces *adharma* and *dharma* as cosmic conditions for motion.
- **Bauddha (Hinayāna)**: emphasizes momentariness of *paramāṇus*, rejecting eternal motion.
- **Cārvāka**: denies non-material causality, attributing motion purely to materiality.

These diverse perspectives contribute to a pluralistic discourse on matter and universe, reinforcing the centrality of dynamic processes in Bhāratīya metaphysics.

Summary and Conclusions

In this study, direct comparisons between ancient Bhāratīya cosmological theories and modern scientific paradigms have been largely avoided to prevent misinterpretations or superficial equivalences. Nevertheless, it is worthwhile to acknowledge certain convergences in metaphysical orientation.

Realism, as articulated in classical Western science—wherein the external world is considered ontologically independent of human perception—finds resonance in several schools of Bhāratīya Darśana, notably Vaiśeṣika, Nyāya, Mīmāṃsā, Jaina, Hīnayāna

Buddhism, and Cārvāka. These traditions affirm the existence of an objective reality constituted by elemental substances (*paramāṇus*) and governed by causal laws. The natural world, according to these darśanas, operates through the interaction and transformation of these atomic entities, and all observable phenomena are seen as their manifestations.

A striking philosophical parallel emerges when one considers Newton's view of nature as self-regulating and causally intelligible. Newton posited that causes are immanent in nature and are sufficient to explain natural phenomena without invoking metaphysical or theological interventions. This perspective is remarkably prefigured in Kaṇāda's exposition of *Ārambhavāda* (the doctrine of origination), where he postulates that *dravya* (substance) is the *inherent cause* (*samavāyikāraṇa*) of all worldly events. This not only places causality within the fabric of matter itself but also situates physical change within a logical and ontological framework that is accessible to rational inquiry—an epistemic move similar in spirit to the methodology of early modern science.

However, a distinguishing feature of schools of Bhāratīya Darśana is their holistic integration of matter and consciousness. Unlike classical mechanics, which typically brackets subjective experience, many Bhāratīya darśanas—from the Vaiśeṣika pluralistic description, Advaita Vedānta's non-dualism to the Sāṁkhya's dual ontology—ultimately situate the material world within a broader metaphysical scheme that includes *puruṣa* (conscious self) and its journey toward *mokṣa* (liberation). In this integrated cosmology, physical processes are not merely inertial or mechanistic; they are part of a teleological unfolding, culminating in the realization of spiritual freedom.

Thus, while Vaiśeṣika and allied schools offer a proto-scientific model grounded in logical realism and atomistic naturalism, they are embedded within a cultural-intellectual matrix that refuses to dichotomize the ontic (what is) from the axiological (what ought to be). This philosophical framework retains relevance not only for understanding the history of science in a global context but also for informing contemporary discourses on science, consciousness, and metaphysics.

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