

Indian Knowledge System and the Concept of Matter: A Review of Ancient Philosophical and Scientific Perspectives

Samuel Lallianrawna

Department of Chemistry, Govt. Zirtiri Residential Science College

Abstract

This review work synthesizes viewpoints from ancient philosophical schools and scientific writings to examine how matter is conceptualized within the Indian Knowledge System (IKS). It looks at how various traditions have approached the nature, structure, and transformation of matter, ranging from Vaisheshika's atomism and Ayurveda's elemental theory to Samkhya's dynamic Prakriti. Insights into the applicability of these antiquated frameworks in current scientific discourse are provided by the study, which emphasizes the fusion of metaphysical investigation and empirical observation.

Keywords: IKS, philosophy, metaphysics, atomism, Ayurveda, samhita

1. Introduction

The Indian Knowledge System (IKS) encompasses a wealthy tapestry of philosophical and medical thought developed over millennia. India's highbrow background is a unique amalgamation of profound philosophical inquiry and empirical medical exploration, rooted in texts and traditions spanning over 3,000 years. This synthesis of darshanas (philosophical structures) and shastras (sciences) reflects a worldview in which metaphysics, ethics, and fabric understanding coexist. Central to IKS is the exploration of be counted (Prakriti, Padārtha), which ancient students approached through both speculative philosophy and empirical outlook. This evaluate examines key theories of count number across primary faculties and texts, emphasizing their contributions to information the physical world.

2. Philosophical Perspectives on Matter

Indian philosophy is classified into two main categories: āstika (orthodox) and nāstika (heterodox) schools, both of which explore fundamental questions regarding existence, consciousness, and reality. The orthodox schools, known as Āstika Darshanas, which include Nyaya (established by Gautama), emphasize logic and the theory of knowledge. Nyāya made significant contributions to Indian philosophy through its thorough exploration of logic, methodologies, and treatises on epistemology. Nyana also developed rigorous frameworks for debate and validation of knowledge (pramāṇa: perception, inference, analogy, testimony)¹. The **Vaiśeṣhika** school is known for its insights in naturalism², a form of atomism in natural philosophy³. The theory postulated that everything in the physical universe can be broken down into paramāṇu (atoms), and individuals' experiences arise from the interaction of substance (determined by the number and arrangement of atoms), quality, activity, commonality, specificity, and inherence.^{4,5}. Everything was composed of atoms, and qualities arose from

the combination of these atoms, but the way these atoms aggregated and their nature was influenced by cosmic forces. In essence, Vaisesheka introduced Kanada's atomic theory (paramāṇu-vāda), suggesting that matter is made up of indivisible atoms (paramāṇu) of earth, water, fire, and air, which come together to form the physical world under the guidance of divine will. The Nyaya school adds to this with a strong focus on epistemology, examining perception and the interactions between atoms. **Samkhya** a dualistic orthodox school of Hindu philosophy^{7,8} views physical universe as composed of two independent principles, Puruṣha ('consciousness' or spirit) and Prakṛiti (nature or matter, including the human mind and emotions)^{9,10}. Prakṛiti, composed of three gunas—sattva (balance), rajas (activity), and tamas (inertia)—evolves into the material world through their interplay. This dynamic framework highlights the transformative capabilities of matter, providing a basic structure for subsequent philosophies. Patanjali's Yoga Sutras organized practices for the mind and body to rise above material limitations, in harmony with the metaphysics of Samkhya¹¹⁻¹⁵. Vedanta, also referred to as Uttara Mīmāṃsā, includes concepts that have emerged from or have been aligned with and reinterpreted in the discussions and analyses found in the Upanishads, emphasizing various aspects of devotion, knowledge, and liberation. Vedanta has evolved into numerous traditions, each providing its distinct interpretations of a shared set of texts known as the Prasthānatrayī, which translates to 'the three sources,' namely the Upanishads, the Brahma Sutras, and the Bhagavad Gita¹⁶. Mimamsa emphasized ritualistic interpretation of the Vedas but contributed to linguistics and hermeneutics. Vedanta Interpreted the Upanishads' monistic teachings. Sub-schools like Advaita (Shankara), Vishishtadvaita (Ramanuja), and Dvaita (Madhva) debated matter's reality (maya) and its relation to Brahman (ultimate reality)¹⁷. Advaita Vedanta, as expounded by Shankara, views matter as Maya — an illusion veiling Brahman (ultimate reality). In contrast, Vishishtadvaita (Ramanuja) and Dvaita (Madhva) schools affirm matter's reality as dependent on divine consciousness.

Heterodox Schools (Nāstika Darshanas) like **Buddhism** rejected permanent substance, proposing pratīyasamutpāda (dependent origination) which states that all dharmas (phenomena) arise in dependence upon other dharmas i.e., "if this exists, that exists; if this ceases to exist, that also ceases to exist". The basic principle is that all things (dharmas, phenomena, principles) arise in dependence upon other things¹⁸. The Abhidharma, a collection of Buddhist texts dating from the 3rd century BCE onwards, classified matter (rūpa) into four elements (mahabhūtas) and emphasized the concept of impermanence (anicca)¹⁹. Buddhism's Abhidharma postulates impermanent mahabhūtas (elements), reflecting the principle of anicca (transience). Jainism postulated pudgala (matter) as atomic aggregates with properties like touch, taste, and smell²⁰. Anekāntavāda, or pluralism, a Jain doctrine that addresses metaphysical truths recognizes that multiple perspectives on truth exist, asserting that ultimate truth and reality are complex, comprising various aspects and viewpoints²¹. Jain texts like the Tattvārthasūtra describe pudgala (matter) as atomic aggregates bounded by qualities like stickiness²¹. Charvaka, also known as Lokāyata, an ancient school of Indian materialism emphasizes direct perception, empiricism, and conditional inference as valid sources of knowledge. This philosophical approach embraces skepticism and rejects ritualism²². As a materialist school, Charvaka denies the significance of spirituality, asserting that direct perception is the sole source of knowledge.

Scientific Perspectives in Ancient Texts

The Charaka Samhita and Sushruta Samhita form the basis of medical theory on the five elements: earth, water, fire, air, and ether (or space). These elements are correlated with the bodily doshas. The qualities

of matter (rasa and guna) inform therapeutic practices, highlighting a holistic understanding of material composition. In Ayurveda, the Panchamahabhutas, or five great elements, are considered the fundamental building blocks of the universe and everything within it. These elements — Akasha (space), Vayu (air), Agni (fire), Jala (water), and Prithvi (earth) — are believed to be present in varying proportions in all living and non-living things²³. Ayurveda uses this holistic approach to understand human anatomy, physiology, and clinical practice, considering the interconnectedness of the body, mind, and spirit. In the realm of material sciences, texts like the Arthashastra detail metallurgical and architectural techniques. Additionally, the Tamil Siddhar texts and works from the Kerala School explore alchemy and early chemistry, emphasizing the importance of empirical experimentation²⁴.

Synthesis of Ancient Concepts and Modern Science

In the field of Atomic Theory, the Vaisheshika school of Indian philosophy, developed by the sage Kanad, is best known for its atomic theory, which is also known as Paramanuvada or atomism²⁵. This theory proposes that all objects in the universe are composed of atoms, which are called "paramanu". Vaisheshika's paramanu parallels modern atoms but differs in divine orchestration. Regarding states of matter, the Samkhya gunas, proposed the three gunas (qualities) of prakriti (nature or matter) viz. sattva, rajas, and tamas. These qualities influence the characteristics of all things in the universe and are seen as fundamental aspects of the material world²⁶. Prakriti, in its unmanifest state, is a balanced equilibrium of these three gunas. These gunas may analogize phases of matter (e.g., tamas as solidity). Anicca (impermanence) is a fundamental principle in Buddhism, stating that all conditioned things are impermanent, arising and passing away²⁷. This aligns with the scientific concept of entropy, which describes the tendency for systems to move towards disorder and randomness over time. According to Ayurveda, the five elements of the universe – earth, water, fire, air and space are not just abstract concepts; they are woven into the very fabric of our existence, governing our physical and mental states thus advocating that elemental balance mirrors system biology.

Scientific Thought and Innovation

Ancient India's scientific traditions were intricately linked to philosophy while remaining empirically grounded. In key fields such as astronomy and mathematics, the Vedic period's calendrical calculations based on astronomical observations are documented in the Vedanga Jyotisha, dating back to the 12th century BCE. During the classical era, Aryabhata (5th century CE) made significant contributions by calculating π (pi), explaining eclipses, and proposing that the Earth rotates. Brahmagupta (7th century CE) defined zero as a number and formulated algebraic rules. The Kerala School (14th–16th centuries CE) further advanced mathematics by developing infinite series for trigonometric functions and laying groundwork for calculus²⁸.

In the medical sciences, the Sushruta Samhita is considered a foundational text for Ayurvedic surgery. It provides detailed descriptions of surgical principles, instruments, and procedures. Sushruta's work includes information about over 100 surgical instruments and various operative methods, including abdominal surgeries like those addressing intestinal obstructions and hernias. The Sushruta Samhita also covers anatomy, embryology, toxicology, and therapeutics, emphasizing the necessity of surgical training and the surgeon's proficiency with instruments.

Additionally, the Charaka Samhita offers a comprehensive understanding of the human body, diseases, and their treatments. It addresses various aspects of medicine, including diet, hygiene, prevention, and

medical education, highlighting the importance of collaboration among physicians, nurses, and patients. The text also details over 800 medicinal herbs and 8,000 herbal-mineral formulations²⁹.

Ancient India's scientific traditions were also closely connected to chemistry and metallurgy. For example, the Rasayana Shastra (Alchemy) as explored by the Tamil Siddhars and Nagarjuna delved into metal transmutation and the creation of medicinal elixirs. This tradition focused on the therapeutic use of metals and minerals, particularly mercury, to promote health and longevity. Commonly referred to as the "Science of Mercury," it involved preparing specific formulations known as Rasayana medicines, designed to rejuvenate the body, enhance vitality, and improve overall well-being³⁰.

In the field of metallurgy, ancient Indians employed a unique "forge welding" technique, leveraging the inherent properties of iron to create rust-resistant structures³¹. This method preserved a high phosphorus content in the iron, which, in combination with oxygen, formed a protective layer of iron oxide and crystalline iron hydrogen phosphate, effectively preventing rust. A prime example of this rust-resistant technology is the Delhi Iron Pillar, dating back to the Gupta period (4th century CE).

In the fields of architecture and engineering, Vastu Shastra, the ancient Indian science of architecture, synthesizes geometry and ecological principles to create harmonious living spaces. It employs geometric patterns, such as the "Vastu Purusha Mandala," to balance energy flow and align buildings with natural forces and cosmic energies³². This approach, rooted in ancient texts, emphasizes symmetry, directional alignments, and the importance of natural elements like light and ventilation, thereby fostering a connection between architecture and the environment.

3. Conclusion

Indian philosophical and scientific traditions represent a quest to harmonize material and spiritual understanding. Ancient Indian scholars developed sophisticated models of matter that blended metaphysical inquiry with observational insight. While a direct equivalence with modern science is not possible, their conceptual frameworks provide valuable perspectives on material continuity, transformation, and interconnectedness. Future research could explore the historical interdisciplinary exchanges and their implications for contemporary science. For instance, Ayurveda classifies the human population into three major constitutions: Vata, Pitta, and Kapha, along with their possible combinations. The homologous relationship between these classifications and human genetic structure has yet to be studied for validation. The synthesis of ancient wisdom with scientific writings highlights India's enduring role as a cradle of intellectual and spiritual exploration.

References

1. Nyaya (Retrieved 3 May 2024). Logic, Epistemology, Ethics. Britannica". www.britannica.com.
2. B Gupta (2012). An Introduction to Indian Philosophy: Perspectives on Reality, Knowledge and Freedom, Routledge, ISBN 978-0-415-80003-7, p 171–189.
3. Dale Riepe (1996). Naturalistic Tradition in Indian Thought, ISBN 978-8120812932, p 227-246.
4. Kak, S. (2016). 'Matter and Mind: The Vaisheshika Sutra of Kanada'. Mount Meru Publishing, Mississauga, Ontario, ISBN 978-1-988207-13-1.
5. Wayback Machine, J Ganeri (Archived 18 March 2019). Analytical philosophy in early modern India. Archived at the Stanford Encyclopedia of Philosophy

6. Oliver Leaman (1999). *Key Concepts in Eastern Philosophy*. Routledge, ISBN 978-0415173629, page 269.
7. Osto, Douglas (January 2018), "No-Self in Sāṃkhya: A Comparative Look at Classical Sāṃkhya and Theravāda Buddhism", *Philosophy East and West*, 68 (1): 201–222, doi:10.1353/pew.2018.0010, S2CID 171859396
8. Gerald James Larson (2011). *Classical Sāṃkhya: An Interpretation of Its History and Meaning*. Motilal Banarsidass, ISBN 978-8120805033, pages 154–206.
9. Haney, William S. (2002). *Culture and Consciousness: Literature Regained*, New Jersey: Bucknell University Press, ISBN 1611481724
10. Bowker, John (2000). *The Concise Oxford Dictionary of World Religions*. Oxford University Press.
11. Keown, Damien (2004). *A Dictionary of Buddhism*. Oxford University Press.
12. Johnson, W.J. (2009). *A Dictionary of Hinduism*. Oxford University Press.
13. Carmody, Denise Lardner; Carmody, John (1996). *Serene Compassion*. Oxford University Press US.
14. Sarbacker, Stuart Ray (2005). *Samādhi: The Numinous and Cessative in Indo-Tibetan Yoga*. SUNY Press.
15. Flood, Gavin Dennis (1996). *An Introduction to Hinduism*. Cambridge University Press.
16. Sharma, Arvind (2008). *Philosophy of religion and Advaita Vedanta: a comparative study in religion and reason*. Pennsylvania State University Press. ISBN 978-0-271-02832-3. OCLC 759574543
17. Boisvert, Mathieu (1995). *The Five Aggregates: Understanding Theravada Psychology and Soteriology*. Wilfrid Laurier University Press, ISBN 978-0-88920-257-3
18. Bodhi, A comprehensive manual of Abhidhamma, page 3.
19. Long, Jeffery D. (2009), *Jainism: An Introduction*. I.B. Tauris, ISBN 978-0-85773-656-7
20. Charitrapragya, Samani (2004). "Mahāvira, Anekāntavāda and the World Today". In Tara Sethia (ed.). *Ahimsā, Anekānta, and Jainism*. Delhi: Motilal Banarsidass. page. 75–89. ISBN 81-208-2036-3.
21. Acharya, Mādhava (1894). *The Sarva-darśana-samgraha: Or, Review of the Different Systems of Hindu Philosophy*. Translated by Cowell, E. B.; Gough, A. E. London: Trübner & Company.
22. *The Princeton Companion to Hindu Philosophy* (Ed. Puri, B.)
23. Frawley, D. *Ayurveda and the Mind: The Healing of Consciousness*.
24. Debiprasad Chattopadhyaya. *Science and Philosophy in Ancient India*
25. Kanada. *Vaisheshika Sutra* (Transl. Sinha, N.).
26. *The Cambridge History of Science: Volume 2, Medieval Science* (Ed. Lindberg, D.C.)
27. Debiprasad Chattopadhyaya. *Science and Philosophy in Ancient India*
28. S. Balachandra Rao *Indian Mathematics and Astronomy: Some Landmarks*
29. Charaka Samhita (Transl. Sharma, P.V.).
30. *The Cambridge History of Science: Volume 2, Medieval Science* (Ed. Lindberg, D.C.)
31. Balasubramaniam, R. (2000). "Corrosion Sci.", 20, pages 2103–2129.
32. Mehul Hotwani , Priyanka Rastogi (2022). *Vastu Shastra: A Vedic Approach To Architecture*, *International Journal of Engineering Research & Technology (IJERT)*, 11 (2), 295-298.