

INDIAN CULTURAL HISTORY — Postclassical Period

Stuart Blackburn, Ph.D.

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Part I : SCIENCE

Overview Although not typically associated with rigorous scientific enquiry, India has a long tradition of exploring the natural world. As in the West, traditional Indian scientists made generalisations, tested them and adjusted their theories according to the results. One distinguishing feature of Indian science, however, is that it relied on a single set of ‘proofs’ (*pramana*), unlike western science which used different proofs for different scientific fields. Although Indian proofs were secular, they were influenced by underlying cultural concepts, just as western science was influenced by Christian metaphysics. The primary fields of traditional Indian science are linguistics, astronomy, astrology, mathematics and medicine. While India is not considered the world’s technology laboratory, it did also contribute to computer science.

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Astronomy Astronomy, or the study of heavenly objects and phenomena, was a second important Indian science during the classical period. As with many cultures, rituals were observed in coordination with the movements of the sun, moon and planets. By the early centuries of the Christian era, Greek influences are evident in Sanskrit astronomical texts. The great trio of scientists (Aryabhata, Bhaskara and Brahmagupta, all 6th-7th centuries CE) agreed that the motion of the planets was elliptical and not circular. These scholars also mention the use of a sundial (the gnomon, or *sanku*), which indicated directions, latitude and time of observation. Other instruments were later used to determine time from the height of the sun.

Mathematics Since astronomy depended on accurate mathematics, two of these astronomers also made major contributions to mathematics. Aryabhata developed new rules for solving quadratic equations and established the study of trigonometry. He also created the place value (or positional) system for numbers, which is used around the world today. Earlier inscriptions did include marks for the numbers 1 through 9, 10, 90 and 100, in which the zero was represented by a dot. But Aryabhata developed the fully positional system and dispensed with the previous system that used letters of the alphabet to represent numbers. Born approximately a century later, Brahmagupta wrote four significant treatises. His most important achievement was laying down clear rules for arithmetic, particularly for the multiplication of positive, negative and zero values.

Bakhshali manuscript The oldest extant mathematical manuscript from India is made of birch bark and written in Buddhist hybrid Sanskrit in the Śāradā script, which was used in the northwest region of the Indian subcontinent between the 8th and 12th centuries CE. The authors of this Bakhshali manuscript cover a wide variety of topics in three areas: arithmetic (fractions, square roots, profit and loss, simple interest, the rule of three, and *regula falsi*); algebra (simultaneous linear equations and quadratic equations); and arithmetic progressions. In addition, the manuscript describes several complex geometric problems, such as how to measure the volume of irregular solids.

Medicine A second medical tradition, which evolved in south India, is Siddha (‘excellence’ or ‘perfection’). Although the early history of Siddha, like that of Ayurvedic medicine, is obscure, there are textual references in the 7th and 8th centuries CE and a transmission of manuscripts leading back several centuries earlier. Siddha practitioners carried out extensive research on plants to discover treatments that would cure patients. Siddha is deeply influenced by Ayurveda and shares its theory of the three humours (or *dosas*, ‘faults’)—air, fire and water—which holds that illness is caused by an imbalance between them. However, its recipe for equilibrium is different,

which is 4:2:1, respectively. Siddha also developed its own medical theory of the 'six pulses': three are read on the right hand, and three on the left hand. Each pulse indicates the state of one of the three humours, in either its right or left manifestation. Another Siddha belief is that the body and mind are composed of seven elements: plasma, blood, muscle, fatty tissue, bone, bone marrow and semen.

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Mathematics Indian mathematics was taken to new levels of complexity by Bhaskaracharya (1114–1185 CE). The son of a Brahmin priest, he became head of a famous astronomical observatory at Ujjain, in western India. Of his six works, three concentrated on mathematics: *Lilavati* ('The Beautiful'); *Bijaganita* ('Seed Counting or Root Extraction'); and *Siddhantasiromani*. He made significant progress in describing a variety of problems, especially the squaring of numbers and arithmetical progression. For example, here is a problem he gave to his readers:

'On an expedition to seize his enemy's elephants, a king marched two yojanas the first day. Now tell me, intelligent calculator, with what increasing rate of daily march did he proceed, since he reached his foe's city, a distance of eighty yojanas, in a week?'

The answer, the author reveals, is that each day the king must travel $\frac{22}{7}$ yojanas further than the previous day to reach the city in 7 days.

Medicine The third tradition of Indian medicine is Unani, lit. 'Ionian' or 'Greek' because Muslim physicians borrowed heavily from Greek and Roman medicine. Indian Muslim medicine, which itself derived from Persian and Arabic (as well as Greek) traditions, developed during the Sultanate period, although it also received court patronage under the Mughals. Like both Ayurveda and Siddha, Unani is based on balancing the body's elements and upon holistic diagnosis and treatment, but it recognises a different set of humours (*akhlāt*): blood, yellow bile, black bile and phlegm. Unani also recognises six other factors in diagnosis: *ada* (organs), *arwa* (life force), *uwa* (energy), *arkan* (elements), *mizaj* (temperament) and *afal* (functions).

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Part II : ART

Early Postclassical Period

Architecture The rock-cut temples, stupas and prayer-halls at Ellora (c. 600-1000 CE) represent a continuation of those same Hindu and Buddhist structures carved earlier at Ajanta, in the same region of western India. In particular, the Kailasanatha temple at Ellora dedicated to Siva is impressive. It was carved out a single rock face, starting from the top and working down. It has a courtyard, a tower, a central shrine, five minor shrines and a columned arcade three stories high with alcoves and sculpted panels. Soon these rock-cave structures gave way to free-standing ones, although both rock-cut and free-standing temples are seen at Mahabalipuram (c. 700 CE). Free-standing temples were built according to conventions laid down in canonical texts (*sastras*), the most important being that the overall design was a symbolic representation of the universe. Temples were largely built with stone, although brick and mortar continued to be used in areas where stone was not readily available. The earliest (and still magnificent) temples were built in the 6th century CE at Aihole and Badami in the Deccan. By the end of the period, several other distinct regional styles had developed, in the far south (Tamil Nadu), on the west coast (Kerala), on the

east coast (Orissa) and in Bengal. Late Buddhist architecture is represented by the great monastery at Nalanda (9th c. CE) and the hall at Bodhi Gaya (6th-7th c. CE).

Sculpture Outstanding examples of early Hindu sculpture are seen on both the rock-cut and free-standing temples at Mahabalipuram and the caves at Ajanta and Ellora. Further developments in stone sculpting of Hindu gods and goddesses are seen on the Kailasanatha temple at Kanchipuram, the Pallava capital, not far from Madras. The 'lost wax' method of bronze casting had been known in the Indus Valley Civilisation (3rd millennium BCE), but it reached perfection in the figures sculpted in South India at the end of this period. Artisans patronised by Chola kings produced bronze figures of deities and rulers with remarkable plasticity and subtlety.

Painting Continuity with the earlier tradition of wall painting is seen in the exquisite images depicted on the walls and ceilings of rock-cut temples at Ellora. Some of the most beautiful images are of graceful *apsaras*, female spirits of air and water in Indian mythology. Although the paintings have deteriorated, copies made by both hand and camera in the 19th century provide us with a good idea of their original beauty.

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Indo-Islamic architecture The sultans of Delhi, and the minor Muslim rulers in the Deccan, oversaw the development of an Indo-Islamic style of architecture characterised by ornate and intricately designed arches and domes. Pillars, mosques and tombs were decorated with floral patterns and calligraphic inscriptions from the Qur'an. The royal tombs of the Lodi Sultans are an excellent illustration of this style. The most famous structure, however, is the **Qutub Minar**, a pillar standing 73 metres high at the centre of a large complex of buildings, including tombs and mosques on the outskirts of Delhi. Made of brick but covered with metal, and later enlarged by adding six storeys made of sandstone and marble, the Qutub Minar is an architectural metaphor for the Sultanate as a whole. Begun in 1192, it was struck by lightning, damaged by an earthquake, repaired and added to throughout the period, reaching its present condition in the early 16th century.

Hindu architecture Some of the most magnificent Hindu temples in India were also built in the early centuries of this period. Regional styles evolved in Bengal, Kerala and Orissa, but the most spectacular temples were constructed in the far south. A large open space, often with a pool of water, was enclosed by a square, with high towers on each of four walls. Outstanding examples are the Nataraja temple at Chidambaram and the Brihadishvara temple at Tanjore, both in modern-day Tamil Nadu.

Sculpture The quality of sculpture in north India declined during the Sultanate and produced a predominance of massive, rigid forms. However, a subtle school of bronze sculpture developed in eastern India, as seen in the images of Buddhist gods and goddesses at Nalanda and Kurkihar. In the south, the tradition of exquisite Chola bronzes (made with the 'lost-wax' method) continued to produce excellent pieces.

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Part III : RELIGION

Overview It is difficult to overstate the significance of religion in India, both historically and in modern times. The ancient Hindu texts of the Vedas are the oldest religious texts still recited and remembered. Buddhism, one of the few truly 'world' religions, originated and flourished in India until its demise starting around 1000 CE. Islam has been in India for a millennium and represents a fascinating instance of religious synthesis, especially at the local level of practice and belief. In addition to these, there is Jainism, still a presence in parts of the country, Christianity, thoroughly assimilated and woven into the social fabric, and finally, the shamanistic systems of India's many tribal populations.

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Devotionalism The second historic shift in Indian religion (after the turn the ritualism in the Vedas to speculation in the Upanishads) was the development of devotionalism, known as *bhakti* ('to share in', 'to belong to'). Characterised by an intense and personal attachment to a particular god or goddess, saint or guru, devotionalism illustrates the regionalism of the period. Until the bhakti movement, religious thought had been expressed almost exclusively in Sanskrit, the preserve of ritual specialists and court poets. Then, beginning in about 500 CE in the Tamil country, religious poetry, myth and song were composed and sung in the languages of common people. Favoured by royal patronage, the movement spread across the face of the subcontinent and has been the life-blood of Hinduism ever since. Even Buddhism, which the bhakti poets 'sang out of India,' was affected by devotionalism. New Mahayana figures, such as bodhisattvas (Avalokitesvara and Maitreya) and goddesses (Padmini and Tara) were worshipped in shrines and with rituals similar to those in Hinduism.

Philosophy A parallel shift occurred in Hindu religious philosophy, as illustrated by Shankaracharya. Shankaracharya was a religious philosopher who lived in South India, probably in Kerala and probably in the first half of the 8th c. CE. He is arguably the most influential theologian in all Indian history. Tradition holds that he became a wandering ascetic at an early age, travelled north to Benares and debated with religious thinkers all over India. It was a time of fierce rivalry, and even violence, between Hindus, Buddhists and Jains. In this maelstrom Shankaracharya wrote commentaries on major Hindu texts to explicate the *advaita* or 'non-dualism' school of Hinduism, which claimed that beneath the flux of our impressions there is an unchanging reality. This is the *brahman*. All else is *maya* or illusion. Although he did not agree with the emotive devotionalism that was sweeping south India at the time, he did provide Hinduism with an uncompromising foundation in its battle against rival religions.

Buddhism Buddhism grew out of Hinduism in the 6th c. BCE through a new eschatology (*nirvana*) and the embrace of a more austere path to enlightenment, especially in the Theravada/Hinayana school. This new, heterodox belief system also rejected the domination of Hinduism's priestly elite in favour of monks and laymen and laywomen, who could follow the path of non-violence and virtue. This ideology, which appealed to the emerging mercantile and trading communities in the cities, was patronised by the Mauryan Empire and spread quickly all over India, including the far south, where it played a major role in literary, social and political life.

Jainism Like Buddhism, Jainism is an offshoot of Hinduism and based on a historical figure who lived in the 6th c. BCE (Mahavira, 'Great Hero'). Again like Buddhism, asceticism and non-violence are central to Jainism. However, a key tenet of Jainism is the indestructible and immortal individual soul (*jiva*), which differentiates it from both Hinduism and Buddhism. Jainism also spread through mercantile groups and contributed to literature and scholarship in many regional languages.

Islam As these large scale developments were unfolding, another key event occurred when Muslims arrived in the subcontinent in the early 8th century CE. Indian Islam did not diverge much from Islam in the Arab or Persian world, although Sufism (itself a Persian import) became a major force and comingled with forms of local Hinduism. For example, Hindu devotionalism and Sufism both focus on a saint as a conduit to divine power, rather than on God himself, and the cults of the Sufi saints (*pir*) became almost indistinguishable from their Hindu counterparts.

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Islam Early Indian Islam was guided by the Qur'an and the Sunna, which tradition held were the words and principles of the Prophet. Thus, the Islam practiced in Delhi in this period would have differed little from that observed in Baghdad or Damascus. There were minor differences, however, especially in the interpretation of Islamic law (*shariah*), resulting from a recognition that adjustments had to be made when Islam conquered people of different faiths.

Sufism Islam during the Delhi Sultanate was also tempered by the Sufis, the wandering Muslim mystics who took their name from the coarse wool tunic they wore. Sufis represented the ecstatic impulse suppressed in legalistic schools of Islam and expressed in their statement: ‘Mystics learn from God; scholars learn from books.’ Although Islam held that the only path to Paradise was unwavering faith in God, Sufi saints believed that one could draw closer to God during one’s lifetime and thereby experience mystical oneness. As singers and poets, they helped to spread Islam through the countryside in a way that traditional Islamic teachers could not. The Sufi poet-saints were virtually identical to the poet-saints of devotional Hinduism. Both groups sang of a direct, personal contact with the divine, a power that they believed transcended petty social categories like caste and religious identity.

Hinduism Devotionalism, which had begun centuries earlier in the Tamil country, spread like wild fire across the entire subcontinent during this period. Hindu poet-saints composed songs in Kannada, Marathi, Malayalam, Telugu, Gujarati, Hindi and Assamese, which sang the praises of deities in the language of common people. The Chola kingdom in the far south and the Vijayanagar kingdom in the Deccan provided the patronage to promote the worship of Visnu and Siva in large temples and local shrines. The philosopher Ramanuja (c. 1017–1137 CE) established a theological basis for devotionalism with his school of *Vishistadvaita* (‘qualified non-dualism’). He explained that a worshipper need not merge into oneness with god (the goal of the rival *Advaita*, or non-dualism, school). Instead, the worshipper could become immersed in god, while still retaining a personal identity; indeed, that personal identity was a prerequisite to forming a bond with god.

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Part IV : PHILOSOPHY

Overview Although less well-known, Indian philosophy is the foundation upon which Indian religion stands. Indeed, modern-day Hinduism is more or less a refinement of ideas found in just one of several schools of classical philosophy, and Buddhism similarly evolved in its various forms through intense philosophical debates. Like all philosophy, Indian thinking is concerned with investigating truth, and while it did not develop certain fields (such as ethics and aesthetics), it excelled in others (such as ontology, epistemology and logic). The complexity of these various schools can only be summarised here, but even this short essay should serve to dispel the idea that Indian thinking has been historically dominated by a belief in god. If we had to single out the primary strand of traditional Indian philosophy, it would not be theism but idealism. Atheism and materialism were also strong philosophical traditions.

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Vedanta The earlier Mimamsa school provided the foundation for the Vedanta schools, which returned to the absolute authority of the Vedas. However, Vedanta shifted emphasis from ritual activity to spiritual activity, meditation, self-discipline and introspection. Three Vedanta sub-schools have dominated Indian thought and theology since the medieval period. The earliest and best-known is the non-dualist or monism position (*advaita*), articulated by Sankara in the 8th c. CE. As its name suggests, this philosophy argues that reality is one and indivisible. In other words, while other thinkers had spoken of the soul/self (*atman*) and consciousness/reality (*brahman*), Sankara argued that they are in fact one and the same. Everything else, any perception of a separate deity or soul, was illusion or *maya*.

Vajrayana Buddhism Vajrayana, the third great tradition of Buddhism, marked a shift away from the esoteric speculations of Mahayana and toward an enactment of enlightenment. The word *vajra* means ‘thunderbolt’ or ‘diamond’ and refers to the permanent core of a human being, in contrast to the illusory ideas and perceptions he or she may possess. Vajrayana is also often called *mantra-yana*, because of its emphasis on the role of mantras in meditation to concentrate the mind in its pursuit of truth. Vajrayana combined the idealism and scepticism of early schools, and added a highly symbolic language of meditation, in order to create the original experience of the Buddha’s enlightenment.

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Visishtadvaita A second Vedanta position, expounded by Nathamuni (11th c. CE) and Ramanuja (12th c. CE), is called ‘qualified non-dualism (*visishtadvaita*)’ because it claims that the personal soul/self is not wholly submerged in *brahman*. In other words, it rejects the argument of the *advaita* (non-dualism) school that the individual soul and the underlying consciousness (*brahman*) are one and the same. Instead, this school argues that the soul must maintain some distance from *brahman* in order for a worshipper to apprehend a deity, who itself contains physical attributes.

Dvaita The third and last Vedanta position is dualism (*dvaita*), as propounded by Madhvacharya (13th-14th c. CE). This school set out to refute the earlier *advaita* (non-dualist) school’s claim of uncompromising monism. Instead, Madhvacharya and other thinkers argued that the soul and god do exist independently, and this independence is what allows us to worship god outside ourselves. Although *dvaita* thinkers accept that there is illusion and transience in the world, they argue that this does not mean that all things are illusory or *maya*.

New Nyaya This Hindu school of thought developed in the 11th or 12th century CE as a merger of the earlier schools of Nyaya and Vaiseshika. Thus it was called Navya Nyaya or ‘New Nyaya.’ Despite its name, Navya Nyāya incorporated classical Vaiseshika metaphysics and classical Nyāya epistemology. The Navya Nyāya authors also developed a precise technical language through which many traditional philosophical problems could be clarified and resolved. This linguistic precision proved to be so versatile that they were employed, not just in philosophy, but in poetics, linguistics, legal theory, and other domains of medieval Indian thought. The foundational text of this school was Gaṅgeśa's brilliant and innovative *Jewel of Reflection on the Truth (Tattvacintāmaṇi)* in the 13th century CE.

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