SOME MODERN IDEAS IN ANCIENT INDIA

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Although the East is often referred to as an ancient civilization and India recognized as having had a great past, little is generally known about India's contribution to the world. Some Western writers occasionally turn lyrical when they speak of India's heritage and pour encomium about her past,[1] but there is often a noticeable reluctance among most Western writers to put India before other countries in certain matters where she has clearly excelled. It is not uncommon for a Western Indologist to be excited on first discovering India's greatness in some area and then cool off on second thought. An excellent example is Max Müller, who at first was excited but then became critical.[2] Ancient Indian achievements were both great and varied, and while it is impossible to go into a full discussion of them in this essay, an attempt is made here to recount and explain some of the modern ideas which existed in ancient India.[3]

First and foremost, perhaps, it should be noted that the word *Ārya* comes from Sanskrit, the ancient classical language of India, and etymologically means "to till," while its literal meaning is "noble." The word abounds everywhere in India's ancient writings. According to Western scholars, the Aryans came to India and settled by about 2,000 B.C. They developed the art of agriculture and were the first in the world to grow rice.[4] They domesticated the cow and got from it milk, butter, and ghee.[5] As civilization advanced, their predatorial habits disappeared (though it has been argued that they were never meat-eaters), and they became vegetarians. They are supposed to have drunk *soma*[6] (see Aldous Huxley's *The Brave New World* for a reference to this drink) and much later developed *panchāmrita,* a drink consisting of five ingredients, used even today on festive and religious days, probably a forerunner of the modern punch.[7] The swastika sign originated in ancient India (and is still used on religious and other important days), though the symbol is reversed in the West. The word *swastika* is itself a Sanskrit word and means "the religiously good or auspicious."

One of the most fascinating things our ancestors imagined is space travel. Not only do we have in the first epic, the *Rāmāyaṇa,* an aerial car called Pushpaka that travels from city to city, from country to country, and from planet to planet but we have descriptions of inter-planetary battles. What is more strange, the plane is an automatic, pilotless one. Elsewhere there is an account of crafts used to travel on water, on land, and in air—all in one craft—with some specifications.[8] In the same epic we have flights by Hanuman and also building of bridges across bays—for example, from India to the island of Ceylon.

This epic abounds in the description of the strange and the fantastic. There are, here, weapons of war and destruction not imagined elsewhere till modern times. There are descriptions of weapons, counter-weapons, counter-counter weapons, and counter-counter-counter weapons, and so on. There is, for example, the fire weapon (Āgnyeyāstra), which the hero of one army might release so as to burn down all that is on the other side of the battle field, but before fire envelopes the whole place (compare napalm or cluster bombs), the opponent releases the water weapon (Vāruṇāstra) putting out the fire while at the same time trying to flood the other side of the battlefield. But the hero quickly releases the

Wind weapon (Vāyuvyāstra), which will disperse the water, and so on. There are even terrible world-destruction weapons and missiles like the Aindrāstra, Pāshupatāstra, Vaishṇavāstra, and finally the ultimate weapon, which can destroy the whole world, Brahmāstra. The last one is unstoppable except by the one who releases and knows how to retrieve it before it hits the target. The knowledge of these weapons is restricted to the few who have been taught by a holy preceptor and who have earned by merit their secret and use. There is even in this epic an instance of something like a chemical weapon (sammōhanāstra),which makes the victim lie helplessly foaming at his mouth. As though this were not enough, we have one instance in which the hero, Rāma, uses a straw to convert its atom into an atomic weapon to destroy a demon attacking Sitā, the heroine.

There are strange beings, animals, and birds, too, in this epic, which we come across in the volume entitled the Forest Volume (Araṇya Parva)—mis-shaped animals, animals with huge bodies but extended limbs with which to scoop up their prey for food, birds far bigger than the condor (Jathāyu), and later a demon looking like a hill (Kumbhakarna). The *Rāmāyaṇa* also tells of the Kingdom of the Apes with descriptions of very advanced skills, organization, and knowledge of sophisticated weapons, including some battles and skirmishes. There are many, many noble thoughts, but one of the thoughts that a successful politician of the present day might remember is what Rama the hero is told: *Avasthā pūjyate Rāma, sharīram na pūjyate*—it is the office one holds that is worshipped, not his person. The *Rāmāyaṇa* also affirms a fantastic belief that life sleeps in matter, breathes through plants, speaks through animals, and is completely conscious in man. The story of Ahalyā, who becomes a stone and rises from it again, is astonishing in its foreshadowing of the modern researchers' finding life in the deep sea, frozen antarctic, and hard rocks.

In the *Bhāgavatha* the concept of cities hanging in outer space appears. The story of Tripurāsura (the Three-City Demon), who owns the city is a terrible story of a demon who inflicts punishment on those whom he does not like by descending with his entire city and alighting on an earthly city! The idea that a man in outer space is simply suspended is best illustrated by the story of Trishanku, who tries to ascend to heaven bodily and is rejected at heaven's gate but is stopped again by the sage Vishwāmithra with the result that the King Trishanku simply is suspended in space! The famous Ten Incarnation stories of Vishṇu or the Dashāvatāra stories are a remarkable set of stories which affirm a variety of beliefs. These incarnations of Vishṇu, the Protector, are believed to have happened in an order which is fascinating for certain implications. Vishṇu is supposed to have come down to earth at the request of the human belings, age after age, to destroy evil and to uphold righteousness in the following order: the Great Fish; the Great Tortoise; the Great Boar; the Great Half-Man and Half-Lion; the Dwarf Man; Rāma with an Axe; Rāma, the Great Archer; Krishṇa, the Diplomat; the Compassionate Buddha; and finally Kalki, although the very orthodox do not accept the ninth one. Biological evolution is clearly and simply illustrated by these incarnations. Social evolution is illustrated by the gradual advance of weapons of war and destruction culminating in the most sophisticated ones mentioned earlier, which are then followed by diplomacy as a means of settling disputes and compassion as the ultimate salvation of mankind. The stories, moreover, affirm a cardinal principle of Hinduism that God is realized by each being at its own level and that God appears to different people in different ways in different ages and speaks in different tongues. In the story of Rāma with an Axe (Parashurāma), there is the affirmation of yet another idea—that it is the father who is the true parent and who passes on the heritage. For, when his

father, who suspects his wife of infidelity, tells the son to kill his mother, the son hesitates to carry out the behest of the father but finally resolves his dilemma and decides that it is the father who is the true parent. The story of Balarāma, the older brother of Krishṇa, illustrates yet another modern idea. When Kamsa, the demon, tries to kill all babies because of the prophecy in heaven that a certain baby will kill him and become the king (reminiscent of Herod-Jesus story), the embryo in the womb of Devaki is transferred to another woman's womb and Krishṇa's older brother is saved. Later on, of course, Krishṇa is born, taken to a cowherd's house and is brought up there, and he finally kills Kamsa. The story of embryonic transfer dating back some 3,000 and more years is astounding. The same work contains the parallel of the story of Noah's Ark—with one difference. In the Indian story it is not pairs of actual animals that are put in the ark but the seeds of pairs, something that can be more realistically accommodated in an ark.

In the second epic, the *Mahābhārata* (the longest ever to be composed by the human mind—it has about 100,000 verses of 32 syllables each, and the epic is in 18 volumes), we have even more modern ideas. For example, the story of Abhimanyu's learning the peculiar war strategy of Padmavyūha (of organizing a battle army) when it was being described by Krishṇa to his sister, Subhadra, in whose womb the unborn Abhimanyu is still resting, contains an extraordinary idea of teaching a fetus and attests to an old Indian belief that one's education begins in the womb and ends in the tomb. Again, the birth of the Pāndavās, the heroes of the epic, by means of the power of the holy spirits of gods invoked by Kunthi, (and her earlier pregnancy while yet a virgin without human intercourse) clearly foreshadows the story of Christ's birth. The way in which the 100 children are born to Gandhari (the idea of humans coming out of eggs—not believed in by the moderns till probably around the beginning of the century—and of one splitting up into 100) is certainly an astonishing idea, however rudimentary it may be. The *Mahābhārata* also contains a highly developed code of warfare and of treating enemies, including those who surrender. Descriptions of fantastic war weapons repeat themselves in this epic. There are also interesting descriptions of gambling and wrestling matches—when we are back about 3,000 years in time. Karate, it must be remembered, originated in India.[9]

Scattered in a number of places are other fascinating ideas. Constantly we come across the concept of *Divya drishti,* or literally *divine sight.* What this means is that sages and others who are advanced beings can tune their minds and know what is happening, has happened, or will happen—so long as the frequency of their mind is in tune with the thing about which they want to know.

Diamonds, cotton, rice, and peacocks came originally from India. In fact, the Golconda mines of the southern part of India were the mines from which the world received all its diamonds in ancient times.[10] In the words of Basham, "India has conferred many practical blessings on the world at large; notably rice, cotton, the sugar cane, many spices, the domestic fowl, the game of chess (p. 208), and, most important of all, the decimal system of numeral notation, the invention of an unknown Indian mathematician early in the Christian era (p. 495f)."[11] It was India and not the Arabs who invented the so-called Arabic numerals. The myth of Arabic invention has gone on too long. There is incontrovertible evidence to prove that India contributed these numerals and the concept of zero to the world. Basham pointedly mentions this fact:

> The earliest inscription recording the date by a system of nine digits and a zero, with place notation for the tens and hundreds, comes from Gujarat, and is dated A.D. 595. Soon after this however, the new system had been heard of in Syria (p. vi), and was being used as far afield as Indo-China. Evidently the system

was in use among mathematicians some centuries before it was employed in inscriptions, the scribes of which tended to be conservative in their system of recording dates; in modern Europe the cumbrous Roman system is still sometimes used for the same purpose. The name of the mathematician who devised the simplified system of writing numerals is unknown, but the earliest surviving mathematical texts—the anonymous "Bakshali Manuscript," which is a copy of the text of the 4th century A.D., and the terse *Āryabhatīya* of Āryabhata, written in A.D. 499—presuppose it.

For long it was thought that the decimal system of numerals was invented by the Arabs, but this is certainly not the case. The Arabs themselves called mathematics "the Indian (Art)" (*hindisat*), and there is now no doubt that the decimal notation, with other mathematical lore, was learnt by the Muslim world either through merchants trading with the west coast of India, or through the Arabs who conquered Sind in A.D. 712.

The debt of the Western world to India in this respect cannot be overestimated. Most of the great discoveries and inventions of which Europe is so proud would have been impossible without a developed system of mathematics, and this in turn would have been impossible if Europe had been shackled by the unwieldy system of Roman numerals. The unknown man who devised the new system was from the world's point of view, after the Buddha, the most important son of India. His achievement, though easily taken for granted, was the work of an analytical mind of the first order, and he deserves much more honour than he has so far received.[12]

There is a question in the history of mathematics asked about India: "When the whole world was groping in darkness, what did India contribute?" The answer is, "Nothing." This Nothing has been the most important thing in the development of mathematics. Again, Basham says,

> "For π Āryabhata gave the usual modern approximate value of 3.1416, expressed in the form of a fraction 62832/20000. This value of π, much more accurate than that of the Greeks, was improved to nine places of decimals by later Indian mathematicians. . . . He [Bhāskara] also established mathematically what had been recognized in Indian theology at least a millenium earlier, that infinity, however divided, remains infinite, represented by the equation $\frac{\infty}{x} = \infty$."[13]

He also adds,

> "Despite their inaccurate knowledge of physiology, which was by no means inferior to that of most ancient peoples, India evolved a developed empirical surgery. The caesarian was known, bone-setting reached a high degree of skill, and plastic surgery was developed far beyond anything known elsewhere at the time. Ancient Indian surgeons were expert at the repair of noses, ears, and lips, lost or injured in battle or by judicial mutiliation."[14]

The Oxford scholar MacDonell puts it even more accurately: "In modern times European surgery has borrowed the operation of rhinoplasty, or the surgical formation of artificial noses, from India, where Englishmen became acquainted with the art in the eighteenth century."[15] As for another aspect of medicine, MacDonell holds, "The *Atharvaveda* and the *Sátapatha Brāhmaṇa* contain an exact enumeration of the bones of the human skeleton."[16] Again, the same scholar notes, "One of the Brāhamaṇas [*sic*] observes that the sun does not really rise or set, but produces day and night on the earth by revolving."[17] A little later he adds that Aryabhata "maintained the daily rotation of the earth round its axis, explaining the daily rotation of the celestial sphere as only apparent."[18]

A number of ideas connected with language and literature arose in ancient India. The oldest grammatical text dealing especially with phonetics goes back to the times even before the famous text of Panini (4th-5th century B.C.), who by all accounts, is the most celebrated grammarian that has ever lived. His *Ashtādhyāyee* records a work which has never been equalled till recent times. Says John Lyons, "The Indian gram-

matical tradition is not only independent of the Greco-Roman but also earlier, more diverse in its manifestations and in some respects superior in its achievements."[19] He adds, "Pāṇini's grammar of Sanskrit has frequently been described from the point of view of its exhaustivness . . . its internal consistency and its economy of statement, as far superior to any grammar of any language yet written."[20] Indians were also the first to produce indexes or *Anukramaṇīs*[21] since they had to do so for the Rgveda. The first systematically arranged dictionary, the *Amarakosha,* was produced by Indians; it is unique in its arrangement of nouns, putting together all synonyms, in the form of verse stanzas, which students learn by heart as they would learn poetry. The *Panchatantra,* a seminal influence on stories of many countries of the world of ancient times, is indeed a remarkable book. Its framing device, or the frame story device, has been used subsequently by a large number of writers including Chaucer in his *Canterbury Tales.*[22] It influenced *Arabian Nights* stories, and MacDonell says, quoting another source, "The story of the migration of Indian fairy tales from East to West is more wonderful and instructive than many of those fairy tales themselves."[23]

About 4,000 years ago even as today, Indians thought of ten directions—the eight common ones plus up and down. We read about the ten directions in the Rgveda, and in the *Rāmāyaṇa,* the King is called Dasharatha, one whose chariot can go unchallenged in any of the ten directions. Similarly, in ancient times, as today, India had thought of five elements constituting the universe as well as the human body, these being fire, earth, water, air, and space. Without space, the fifth element, our bodies would simply be one single block. Again, there is a curious question asked in one of ancient scriptures with a curious answer: "What is this universe? From what does it arise? Into what does it go?" "And the answer is: In freedom it rises, in freedom it rests, and into freedom it melts away."[24] One of the weapons used by Vishṇu and Krishṇa is called Chakra (wheel). When it is released, it goes and kills the enemy and comes back—a better version of the Australian boomerang!

Indians have had their own way of computing time and their own calendar. They also thought that time was differently measured in different parts of the universe. The Indian concept of time even today as in ancient India is a circular one—not a linear concept. They had imagined then, and imagine now, that Brahman, the Creator goes to sleep for eight billion years and then wakes up again. In one of his television lectures Carl Sagan, the American scientist, has pointed out how this computation of eight billion years is very close to the scientific calculation of the contraction of the universe! One of the ancient philosophers, Patanjali, is very modern and anticipates modern science when he says, without postulating a creation, in his *Yogasāstra* that life comes into being when matter and life-force come together. The use of a rosary, washing of the feet of elders on religious occasions, putting the sacred ash on one's forehead (especially among certain sub-groups of Hindus), and praying with folded hands (a form of greeting—in contradistinction to shaking hands in the West) have all existed for more than 3,000 years in India and can be easily documented.

In the composition of secular literature also India was far advanced in ancient times. India's greatest, and not the first, dramatist, Kalidasa, who has been much extolled by English, German, and French writers lived in the 5th century A.D.—eleven centuries before Shakespeare. His dramas are complete with plots containing a king, queen, and court jester and all, and what is more, has a prologue, acts, scenes and epilogue (Shakespeare, it must be recalled, did not divide his plays into scenes). India had drama theaters built to exact specifications.[25] In secular literature ancient India was one of the

earliest civilizations to produce romances, which are only one step from what is called novels today. Dandin's *Dashkumāracharita* (6th century A.D.), Bana's *Kādambarī* (7th century A.D.), and Subandhu's *Vāsavadatta* (7th century A.D.) are great works of fiction. Horrwitz says, "Bâna has written the best Sanskrit novel."[26] Today, the word *kādambari* is used in three Indian languages (Kannada, Telugu, and Marathi) to mean "a novel." However, modern novels with all their attention to individuals and with overwrought emphasis on individuals' feelings and thoughts and the central importance of man in the world could not have been produced by ancient Indians, who regarded man as merely a speck in a vast universe except for his soul power. Only when the influence of the West, with its Judeo-Christian tradition and its belief in man as the center of the universe, reached India did India produce modern novels.[27]

One area in which ancient Indian custom and modern Western practice are virtually identical is in the area of teaching. Unlike the modern Indian practice of professors' lecturing to passive students, ancient India chose to teach on an individual basis (each student chose a teacher and the teacher would have to accept him) and by means of question-answer method. The earliest examples of this practice are to be found in the Upanishads, in which stories containing some of the highest truths of India are found to be taught in a dialogue fashion. The *Panchatantra* illustrates the use of circular thinking necessitated by the student's constant questions with the result that even before one story is finished another must begin and so on. Finally, ancient India had a passion for analysis. Indians analyzed and analyzed, and categorized and categorized. Till recently, Indian children in grade school used to learn by heart categories of various things—those that exist in two's, in three's, in four's and so on. This analysis and categorization was applied even to a passionate subject like love, of which Vātsyāyana's *Kāmasūtra* (The Hindu Art of Love) is a redoubtable example. These are some of the modern ideas of ancient India.

Notes

[1] See, for example, the respected American Scholar Arthur W. Ryder's Introduction to his translations of Kalidasa's selected writings, *Shakuntala and Other Writings* (New York: Dutton 1959). The book also carries the German poet Goethe's exaltation of Kalidasa's *Shakuntalam.* Subsequently, he modelled his *Faust* using a Prologue in the manner of Kalidasa. See also Mark Twain [Samuel Langhorne Clemens], *Following the Equator,* in *The Complete works of Mark Twain,* American Artists' ed., 24 Vols (New York: Harper, 1925) 2:16-17, for a frank and mixed reaction.

[2] When he gave his first lectures at Cambridge University, Max Müller was exultant and called the Vedas "the first words the Aryan man spoke" and later turned partly critical. Perhaps the following words from Max Müller give a flavour of is natural and spontaneous initial reaction to the discovery of India's greatness—a reaction uninhibited by other considerations. "If I were to look over the whole world to find out the country most richly endowed with all the wealth, power, and beauty that nature can bestow—in some parts a very paradise on earth—I should point to India. If I were asked under what sky the human mind has most fully developed some of its choicest gifts, has most deeply pondered on the greatest problems of life, and has found solutions of some of them which well deserve the attention even of those who have studied Plato and Kant—I should point to India. . . ." Max Müller, *India: What Can It Teach Us?* Ed. K. A. Nīlakantha Sastry 2nd ed. (Delhi, India: Munshi Ram Manohar Lal, 1961) 6.

[3] The term *ancient India* is used in this essay with the commonly accepted meaning of referring to the period from about 1,500 B.C. or 2,000 B.C. till about the 7th century A.D.

[4] See A. A. MacDonell, *India's Past: A Survey of her Literatures, Religions, Languages, and Antiquities.* Varanasi, India: Motilal Banarasidass, 1956, p. 7. Originally published by Oxford University Press.

[5] Ghee is melted butter oil, as it is called in America. In a hot country at a time when refrigeration was unknown, how astute it was of Indians some 4,000 years ago to come up with an idea to preserve butter! Even today it is the same procedure followed by all in India.

[6] Soma was a mildly intoxicating drink but sura was the forbidden one. For an interesting study of the soma plant, see R. Gordon Wasson *Soma: Divine Mushroom of Immortality* (n.p.: Harcourt, n.d.) Printed in Italy.

[7] E. Horrowitz says, "*Punch* is an Indian beverage consisting of 'five' ingredients." See *A Short History of Indian Literature* (London: T. Fisher Unwin, 1907) 140, f.n.

[8] See *The Hindu,* a very highly respected and overly cautious newspaper of India. "Aeronautics in the Vedic Age," Sunday 27 May 1973, the editorial page.

[9] Karate originated in India, but some writers merely recognize its strong influence on its development. See *The Oxford Companion to World Sports and Games,* ed. John Arlott (London: Oxford UP, 1975) 562.

[10] G. F. Herbert Smith, *Gem-Stones and Their Distinctive Characters,* (London: Methuen, 1912) 137, where he says, "The whole of the diamonds known in ancient times were obtained from the so-called Golconda mines in India."

[11] A. L. Basham, *The Wonder That Was India: A Survey of the Culture of the Indian Sub-continent Before the Coming of the Muslims,* (New York: Grove Press, 1959) 485.

[12] Basham 495-496.

[13] Basham 496. Ancient Indians had a creative mathematical imagination, and they imagined vast numbers of great magnitude. Jawaharlal Nehru gives some interesting facts about this amazing conception of stupendous numbers by Indians. Says he, "The time and number sense of the ancient Indians was extraordinary. The Greeks, Romans, Persians, and Arabs had apparently no terminology for denominations above the thousand or at most the myriad ($10^4 = 10{,}000$). In India there were eighteen specific denominations (10^{18}), and there are even longer lists. In the story of Buddha's early education he is reported to have named denominations up to 10^{50}.

At the other end of the scale there was a minute division of time of which the smallest unit was approximately one-seventh of a second, and the smallest lineal measure is given as something which approximates to 1.3×7^{-10} inches. . . . To them [Indians] the vast periods of modern geology or the astronomical distances of the stars would not have come as a surprise." *The Discovery of India* (London: Meridian Books, 1951) 97-98.

[14] Basham 499-500.

[15] MacDonell 185.

[16] MacDonell 180.

[17] MacDonell 186. See also Nehru, *The Discovery,* 76, where he says, "There is an odd and interesting passage in one of the Upanishads (the Chhandogya): 'The sun never sets nor rises. When people think to themselves the sun is setting he only changes about after reaching the end of the day, and makes night below and day to what is on the other side. Then when people think he rises in the morning, he only shifts himself about after reaching the end of the night, and makes day below and night to what is on the other side. In fact he never does set at all.'".

[18] MacDonell 190.

[19] John Lyons, *Introduction to Theoretical Lingustics* (Cambridge, England: Cambridge UP, 1971) 19.

[20] Lyons 20.

[21] MacDonell 19.

[22] See W. F. Bryan and Germaine Dempster, eds., *Sources and Analogues of Chaucer's Canterbury Tales* (New York: The Humanitties Press, 1958) 6.

[23] MacDonell 126.

[24] Nehru 74-75.

[25] A. Berriedale Keith, *The Sanskrit Drama: Its Origin, Development, Theory, and Practice* (London: Oxford UP, 1970) 358-360.

[26] Horrwitz 137.

[27] It is the theory of this author that the form of literature called novel today did not develop in India not because Indians were preoccupied with the fantastic as some have thought but because of their modesty about themselves as human beings and their correct understanding of their importance and place in the universe. They did not make man the supreme creation, God's favourite, and centre of the universe. Such a mind cannot produce a novel, where sometimes the most trivial thoughts of a character are delineated at length. Modern novels give paramount importance to the individual in a universe where the planet on which an individual lives is itself of diminutive importance.