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# Cosmic Dance

The year 2007, the sixtieth year of Indian independence, will be remembered for its resplendent showcasing of South Asian art through exhibitions across world capitals. The Guimet in Paris exhibited spectacular Greco-Indo-Bactrian treasures from the Kabul Museum, while the 'Tejas' exhibition at Brussels' Palais du Beaux Arts presented a breathtaking panorama of Indian art. The incandescent Gupta exhibition at Grand Palais in Paris, displayed masterpieces from 17 Indian museums; and 'Chola: Sacred Bronzes from Southern India', at the Royal Academy of Arts in London, enticed one into the intricate world of Chola bronzes (ninth to thirteenth centuries AD) that fluidly captured in bronze the sensuous visions of Tamil poet-saints.

Perhaps the most riveting image among all the exhibits was the morbidly beautiful shadow captured from the rear of a Chola Nataraja at the Brussels exhibition. It epitomized aspects which lie beyond the artefact and its visual apprehension alone. The idea of an apprehension beyond vision was taken from a book of this title,

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written by the late astronomer-musicologist Jon Darius, who used this metaphor to explain how scientific photography had revealed aspects, which are beyond literal vision. The phrase 'Beyond Vision' resonated through my own intellectual and personal odyssey into the study of Chola bronzes and the Nataraja, which began with my attempts to use science to reveal aspects that are beyond the art historian's visual gaze. This included an exploration into how archaeometallurgical study can help resolve issues of the stylistic attribution, dating and provenance of these bronzes. Collaborating with the late astrophysicist and Director, Nehru Planetarium, Dr. Nirupama Raghavan, I had also been exploring whether the creators of the Nataraja icon (which is often described as the Cosmic Dance of Siva) really had a perception of the cosmos, in a more astronomical sense, a point that had not really been explored in previous art historical literature.

At one level, Chola bronzes represent an intensely visual culture of the activities of gods; of seeing and being seen as they were carried out in procession, followed by concealment in the sanctum. In fact, Tamil saint-poets have written passionately of their beauty. However, I have been intrigued to explore how the bronze deities were also at times apparently perceived by their devotees as being literally and metaphorically 'Beyond Vision'. This mystical longing is best revealed in a verse to Nataraja by that most evocative ninth century Tamil saint-poet, Manikkavachakar:

Ah, when will I get to gaze upon the unique  
One to whom no other compares  
Him who is fire, water, wind, earth and ether,  
Him whom others cannot understand...  
—Manikkavachakar, (Yocum 1983:20)

Equally extraordinary was the craftsmen's ability to get beyond the visual plane and transmit a sense of the transcendental. The inspiration they drew from the rich poetic/liturgical tradition is suggested, for example, by the correlation between an eight-armed Chola image of Siva as Bhatraya from Tiruvengadu and a Tamil verse by saint Tirumilar:

The only one is He; the second is His Sweet Grace (Sakti);  
He stood in the three (i.e. creation, preservation and dissolution).

He uttered the four (*Dharmas*);  
 He conquered the five (*Senses*); He spread  
 Himself out as the six (*Adhargas*)  
 He stood transcendent as the seventh, knowing the eighth.  
 —Rathnasabhapathy (1982:45)

This verse resonates with an almost mathematical rhythm that one could expect from a land that invented the zero. It also reminds one of how, within the Indian tradition, the orderly, rational/'mathematical' or 'scientific' aspects could also coexist with the irrational, the unscientific/religious, or the mystical. It is in encounters such as these when, even as a scientist exploring the cosmic Nataraja, I am stunned by aspects that appear ultimately beyond science and scientific vision.

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The art of processional bronzes emerged in the Tamil country, in the sixth to twelfth centuries, out of the creative foment of Bhakti worship when the saint-poets composed passionate hymns praising their chosen deities. The Tamils had one of the most outstanding, essentially secular, poetic traditions in Sangam poetry (c. third century BCE-AD). This corpus distinguishes between the *akam* genre, concerned with the inner space of intimacy and love, and the elegiac and bardic *puram* genre of the outer space of valour, warfare and martyrdom. At the same time, a fascinating creative tension was generated by the interplay of *akam* and *puram*, of inner and outer space as indicated in the haunting translations of A.K. Ramanujan (1980:108-9):

Bigger than earth, certainly,  
 higher than the sky,  
 more unliathomable than the waters  
 is this love for this man.

This interplay between dualities, of microcosm and macrocosm, and of the reconciliation of opposites seems to also be brilliantly captured in Chola bronzes. The superbly crafted eleventh century Ardhhanariswara in Chennai's Government Museum epitomizes the complementarity of the male and female halves of Siva. Saiva

Siddhanta ritual associated with Chola temple worship, itself oscillated between the intimate communion with the pillar-like stone *lingam* representing Siva within the sanctum, and the public processional worship of metal deities such as the dancing Siva outside the sanctum during festivals.

The repertoire of the contemporary 'classical' dance form of Bharata Natyam, reconstituted from the wreckage of the abolished devadasi temple dance tradition of *sadir*, similarly oscillates between the inner space of *abhinaya* (expressive dance) and the outer space of an impersonal, geometric rendering of pure dance. From being the preserve of a small community in 1920, *sadir* as Bharata Natyam, adapted in post-Independence years to a concert setting, has grown spectacularly to acquire a worldwide following. Even as one might rue the loss of the authentic practitioners, the lost Balasaraswathis, the devadasi dance tradition has been transformed and re-created, into a leitmotif of the Nataraja icon itself.

In the eleventh century, the Brhadisvara temple built by Rajaraja Chola, embellished with 108 *karanas* (dance postures) sculpted around it, had some four hundred dancing girls in attendance. It is moving, though, that the great Manikkavachakar himself could be driven to ecstatic dance by his contemplation of Nataraja as in this verse (Yocum 1983:30):

He...revealed His foot which is like a tender flower,  
 caused me to dance  
 entered my innermost part (*akam*)  
 became my Lord...

French sculptor August Rodin brought global attention to a Chola Nataraja bronze from Government Museum, Chennai, with 'La Danse de Siva' (1913), describing it as '*une chose divinément réglée*' (a divinely ordered thing). The geologist-turned-art historian Ananda Coomaraswamy, *Wife of Nataraja as representing 'poetry, but, nevertheless science'* in *The Dance of Siva* (1924). Interestingly, they almost poetically echo the lover-beloved sentiment of the devotional Tamil Bhakti hymns: Rodin compares the grace of Nataraja to the Medici Venus, Coomaraswamy to the 'dancing Eros Protoponos of Lucian'.

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Displayed at crafts emporia across Indian cities, the Nataraja bronze is now a ubiquitous symbol of the tenacious survival of age-old Indian craft traditions. In the '90s, *Time* magazine prophetically featured it as a symbol of a changing India on its cover. Commentators have used the metaphor of Siva's matted locks capturing the Ganges to convey the idea of the role of trees and forests in preventing floods. With the threat of global warming and climate change looming over the planet, the metaphor of the destructive cosmic dance seems ever more apt. Yet, even as it makes for great kitsch in the form of brightly coloured batik, the dancing Siva is a symbol of all that has been lost as well as all that has not only endured but also kept up with the times.

So if there is a chasm between the classicism of Chola bronzes and present-day crafts, it is due to the disruption in the centuries-old traditional milieu of the craftsmen wrought by the present age of mechanized mass production. The lost creative synergy between the craft of lost-wax casting and poetry come through in a fine poem by the woman saint, Andal (c. 800):

O rain clouds  
 seeming like dark clay outside  
 liquid wax within  
 rain down upon Venkaiam  
 where the handsome lord dwells...  
 (Deheja, 2002:13)

Nevertheless, the distance travelled, post-Independence, in nurturing traditional crafts in India can be gauged from E.B. Havell's comment in 1904 that 'they (craftsmen) and artisans all over India are constantly in want of work, for departmentalism has no need of their services...'. Jasleen Dhamija (1970:6) points out that Gandhi's *swadeshi* movement focused attention on the plight of the Indian craftsmen and lauds the dynamic guidance of Kamaladevi Chattopadhyay, which helped to sustain the crafts as a vibrant part of the economy by setting up a network of Crafts Councils after Independence.

At the little hamlet of Swaminalai near Tanjavur, a few hereditary *shilapis* still cast images by the traditional lost-wax process. They often still use palm fronds for marking out the traditional *tala*

proportions for icons. Although south Indian metal icons are often called *pancha-loha* (five-metalled), my analyses showed that most were of leaded bronze (an admixture of copper and tin) with a few brasses (with copper and zinc). However, random trace additions of gold and silver were also detected, which fitted the explanation of Devasenashapatil that this prescription referred to the addition of an interested client, of pinches of gold and silver to a casting, more for the sake of ritual or *shastra*. The five metals connoted the auspicious elements of earth, wind, water, fire and ether. To invest the metal icon with divinity, temple priests performed ceremonies of the 'opening of eyes' known in Tamil as *kannatharavaraadu* and the 'awakening of the five senses'. Underlying this symbolic devolution of the inner, aniconic lingam into the outer world of anthropomorphic processional *pancha-loha* icons are Saiva Siddhantic concepts of Siva emerging from the formless one to the manifest five-fold, or *Sadasiva*.

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Drawing from thirteenth century Tamil texts such as *Ummavilakam*, Ananda Coomaraswamy lyrically described the Nataraja bronze as representing the *ananda vandava*, or the cosmic dance of creation and destruction. This dance, represented by the drum and fire held apart in opposition, is also the dance of bliss within the consciousness, which destroys the ego. At the Nataraja temple at Chidambaram (dating back at least to the twelfth century), there still exists a unique dual form of anthropomorphic-aniconic worship. In the sanctum is a Nataraja bronze, next to an empty curtained space, representing him as the element, *akasa* or ether/space. Much more than in the western or Judeo-Christian world view, the philosophic concepts that have only recently emanated out of modern physics, such as the complementarity of matter and energy, seem to have been to an extent intuitively appreciated centuries ago in India.

Indeed, the Nataraja bronze was catapulted into the global limelight by the musings of quantum physicist Fritjof Capra in his best-selling book *The Tao of Physics* (1974). He wrote imaginatively that,

For the modern physicists ... Shiva's dance is the dance of subatomic matter. As in Hindu mythology, it is a continual dance

of creation and destruction involving the whole cosmos... The metaphor of the cosmic dance thus unifies ancient mythology, religious art, and modern physics...

In the *CERN Courier* (May 2007), Fritjof Capra mentioned that he was gratified that the CERN cosmic lab, Geneva, had installed a plaque with quotations from *The Tao of Physics*, with a statue of Siva Nataraja, as the Lord of Dance.

In an archaeometallurgical fingerprinting exercise undertaken for my doctoral thesis, 130 representative south Indian metal icons were sampled by micro-drilling from the Government Museum, Chennai, Victoria and Albert Museum, London, and British Museum, London, and analyzed for 18 elements, while 60 were analyzed for lead isotope ratios. Although there is no absolute method of dating solid metal artifacts, lead isotope ratio analysis can assist in exploring typological similarities on the basis of shared metal sources due to geological factors. The lead isotope ratios and chalcophilic trace elements of a control group of images of well-dated or inscribed artefacts were thus calibrated against stylistic or inscriptional criteria (Srinivasan, 1999). This yielded characteristic fingerprints for different stylistic groups of images, which could then be used to 'date' bronzes of uncertain attribution.

Although the Nataraja metal icon with right leg extended was regarded as a tenth century Chola innovation, this study suggested that two fine Nataraja bronzes previously classified as Chola better fitted the metallurgical profile of Pallava bronzes of about 800 AD (Srinivasan 2001, 2004). The likely worship of Nataraja by the Pallava period at Chidambaram with ideas of cosmic creation and destruction is suggested in Manikkavachakar's *Tiruvachakam*, which says, 'let us praise the Dancer (*kuttan*) who in good Tillat's hall dances with fire, who sports (*vilaiyatu*), creating, destroying, this heaven and earth and all else' [Deheja (2002: 103)]. For me, it has been rather lovely and apt, that what had not really been discerned by conventional art history had been revealed through the dance of science and its patterns of elemental and isotopic particles.

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There seem to be astronomical connotations to the rituals associated with Nataraja worship at the Chidambaram temple. Arudra/Ardra darisanam is a ten-day annual festival in December related to the moon being full in the lunar asterism of the *nakshatra ardra* (the reddish star Betelgeuse or Alpha Orionis), associated with the wrathful aspect of Siva. The constellation of Orion and surrounding stars is bathed in the soft glow of the full moon when it is high in the sky at Chidambaram. A thousand years ago, devoid of the present smog and light flares, the stars must have been even brighter in the tropical night sky.

Another annual festival at Chidambaram, the Brahmotsavam of Ani Thirumanjanam, which is related to the lunar asterism of Uttara Nakshatra around June-July, seems to have begun in the mid-eleventh century from inscription. The Indian zodiac of 360 degrees is divided into 27 parts based on the moon's sidereal period such that a nakshatra denotes the longitudinal position of the moon within 13 degrees 20 minutes. Thus, by using astronomical software, Dr. Raghavan could ascertain that in 1054 AD the moon would have been full in Uttara Nakshatra on 11 July. This is uncannily close to the date that Chinese astronomers recorded the crab supernova explosion of 4 July! Although this is a preliminary finding, it could suggest a perceived metaphoric link between an observed cosmic phenomenon and notions of cosmic dance.

Indeed, a drawing from a Tamil manuscript sourced by Raja Deekshitar of Chidambaram shows how the Nataraja icon itself was probably traditionally visualized within the stars around Orion. In an exciting collaborative study with Dr. Raghavan, we took some photographs of Nataraja images dated from archaeometallurgical fingerprinting and plotted star charts for the constellation Orion of that corresponding era onto them. As reported in *Orientations* (Srinivasan, 2006), the star positions were found to a fair extent to correlate with iconometric design as noted in an image in the British Museum attributed from archaeometallurgical fingerprinting to the Pallava period (c. 800 AD). Moreover, the star chart for 1054 AD fitted well the iconometric design of a Nataraja image from Kankoduvarantham archaeometallurgically fingerprinted to the mid-eleventh century AD. Here, the hypothetical position of the crab supernova which exploded in 1054 AD lies near the top left of the head, close to the crescent moon. Chinese records suggest that the

crab supernova came into view with a morning crescent moon near it and was visible for 23 days, being four times as bright as Venus. Even American Indians are believed to have made cave paintings of a supernova with a crescent moon. Could it be that the iconometric design of this icon had indeed taken into account the observation of the supernova explosion?

At any rate, the above studies suggest scope for further investigation into the history of astronomy. No less than celebrated astronomer Carl Sagan suggested that the Nataraja imagery conveyed 'a premonition of modern astronomical ideas'. The star positions superposed on the icons brought to my mind Arthur C. Clarke's science-fiction writings in 2001: *A Space Odyssey*, 'My God! It's full of stars...'. Indeed, a 'cosmic' sensation of being filled with sky and stars permeates a Tamil verse to Nataraja composed by a seventh century saint, Appar:

The Lord of the Little Chamber,  
filled with honey,  
will fill me with sky (nilavam)  
and make me be [5.1.5]  
(Handelman and Shulman, 2004)

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In a recent BBC World programme on Art and the Imagination, Dr. Nigel Spivey revealingly discussed how different cultures (such as the Aztecs, who made spectacular depictions of gruesome ritual killings) dealt with death and mortality through art. He adds that whereas the image of Christ crucified on the Cross also conveys an agonizing death, nevertheless, it transcends this to become a symbol of solace and empathy. In a similar vein, the imagery of Nataraja does have elements of a morbid death cult, as seen in the eerily beautiful evocations of the sixth century Tamil poetess Auvaiyar, who describes him as a ghoul dancing in the cremation grounds. Nevertheless, the Nataraja can also be seen as something of a reassuring and comforting Jungian archetype: spurring the emergence of creativity from loss and destruction as a therapeutic process.

This is especially seen in the light of the great accomplishments of the widowed tenth century Chola queen, Sembiyar Mahadevi, whose dedications to her late husband also present a rare and fascinating example of the 'male muse' in the history of art. Gandaradhitya (949-957 AD), Sembiyar's husband, fasted to death as an ardent devotee of Siva. In the aftermath of her all too early widowhood, Sembiyar Mahadevi flung herself into a flurry of activity commissioning temples and bronzes until 1006 AD, and went on to found a town in her name. Remarkably, she defies the 'sati stereotype' of medieval Hindu womanhood. Whereas Pallava and Chola inscriptions do suggest that sati (immolation/self-immolation of widows) was rare with women being prominent in patronage and public life, there is the odd reference to sati after battle. Sembiyar, it seems, emphatically chose to channelize her loss into creative energy and indeed, the late art historian J.C. Harle ranked her as one of the 'all-time great patrons'. The finest monument to Sembiyar's devotion to her late husband is the Konerirajapuram temple erected in 972 AD. It is at least something of an answer to that ultimate monument to the female muse, the peerless Taj Mahal, dedicated by Mughal emperor Shahjahan to his beloved wife. Sembiyar's story thus epitomizes the notion of 'creation arising, phoenix-like, from the ashes of destruction' as the underlying philosophy and psychology behind the Nataraja bronze. In a country which, post-independence, has still been dogged by ill-treatment of widows and the odd horrific instance of sati as at Deorala, Rajasthan, in 1987 it is worth reminding ourselves that our own history also presents us with empowered models of widowhood.

Some of the above ideas developed out of conversations with the Jungian sculptor Caroline Mackenzie. Intriguingly, my own quest and studies on the cosmic Nataraja have had some apparently surreal and almost 'Jungian' coincidences. The Royal Academy's Chola exhibition concluded close to the day my colleague, Dr. Nirupama Raghavan, finally succumbed to cancer. Similarly, the death anniversary of the late Jon Darius, astronomer-musicologist, Curator, Science Museum, London fell coincidentally close to 11 July, the date of our postulated commencement of the supernova-related festival at Chidambaram. Then, on 20 March 2007, Smt. Narmada, Bharata Naryam guru, whose Nataraja varnam I partly presented at the Royal Academy and who barely a few weeks earlier received this year's

prestigious Sangeet Natak Akademi Award, died of a sudden heart attack. Finally, on 3 May 2007, the Belgian painter-philosopher Jean-Letschert Ascharyacharya, a pupil of the celebrated Belgian surrealist René Magritte, who lived in Bangalore as a friend of the family of C.V. Raman, passed away. I had showed his surrealist painting 'The Cosmic Dance' at the Royal Academy lecture, which depicted Siva Nataraja dancing as if an inner space of the supreme consciousness was radiating outwards and manifesting itself as outer space through swirling patterns of cosmic blues and iridescent colours akin to a supernova explosion. On 7 May 2007, astronomers witnessed the brightest stellar explosion ever, the supernova SN2006gy, which ripped apart a star 150 times more massive than the sun as observed by NASA's orbiting Chandra x-ray observatory.

Thus, in hindsight, my Royal Academy lecture-dance on 'Siva as Cosmic Dancer' had all the surreal quality of a real-time cosmic dance or requiem, where I could pay ultimate tribute to several extraordinary artists, scientists and fellow-seekers. I had then danced to a Tamil poem sung by that legendary doyenne of Carnatic music M.S. Subbulakshmi, penned by Ramalingaswami. The assertion that 'even if all else is forgotten, Nataraja would never be', is especially moving, given that she suffered from Alzheimer's disease towards the end. It seems to me that nothing can keep alive the great mystique of the Cosmic Dance, than these words from Ramalingaswami's poem:

Even if the mother forgets herself,  
 Even if the mother who begets a  
 child forgets herself,  
 Even if the body is forgotten by life  
 Even if life forgets the body  
 Even if the artist forgets all skills  
 Even if the eyes forget to see,  
 The lord who resides within,  
 Namasivaya, I will never forget  
 My only desire is to see  
 The padas, the lovely feet which in Kanakasabha  
 Danced the Cosmic Dance...

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