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HISTORICAL NOTES

Archaeo-astronomy of Naṭaṟāja*

The article[1] on archaeo-astronomy cum polygonal and mathematical model, the *Tārakā* (Starry Pattern), was published before establishing a correlation between 27 bright stars centered around Betelgeuse (α *Orionis*) and their reflection in form of *Śaiva* archaeology on ground at Bhubaneswar (Orissa), with Paraśurāmeśvara as the central monument [Fig.1]. The temple sports a Naṭarāja icon [Fig.2], as the most important art member. In *Tārakā* we have also identified α *Ori*. with Vedic *Rūdra* and the constellation of Orion with *Kālapūrūṣa* (i.e. *Śiva*) and that α *Ori* is at the apparent relative centre of the night sky in the present epoch [Fig.3]. Taking Fig.3 as the base, we have also presented a *nakṣatra* (9 pointed star) wherein, Orion is the hub and 9 star forms the nine regions of the celestial *Nakṣatra* [Fig.4] extending to 60^0 of arc space in any hemisphere. It spans the visible region of the night sky and covers the navigable regions of the oceans. If we superimpose Fig.4 on a zenithal projection, the composite pattern [Fig.5] doubles up as a celestial compass. The relevance of Fig.5 has already been shown before[2], Fig.6, a modern navigator's device, offers a good homology with Fig.5[3]. In other words, the germ of an idea of a compass is traceable in the archaeology of India. The Indian *Naṭarāja* icon has arms spread out all around demarcating various angles of the arc as do Fig.4 to Fig.6. Therefore, a case arises to attempt a superimposition study with the Indian *Naṭarāja* icon.

We know the origin of such concept may be traced to the *Ṛgveda*, which we have spelt out in Ref. No.1[p.54]. We have also been advocating since 1998 in different forums about the identification of Orion with *Śiva* and have specifically reported in the International and National mass media [print and electronic] and in Indian National Trust for Art and Cultural Heritage (INTACH). Particularly, D.

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Fig. 1

Fig. 2

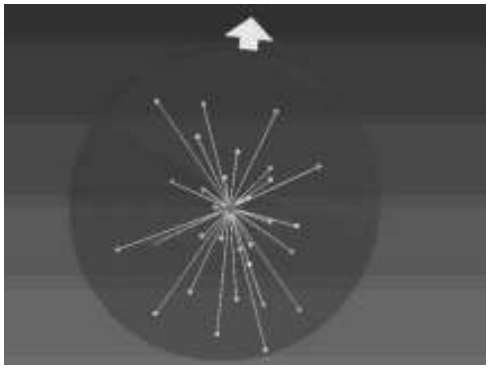

Fig. 3

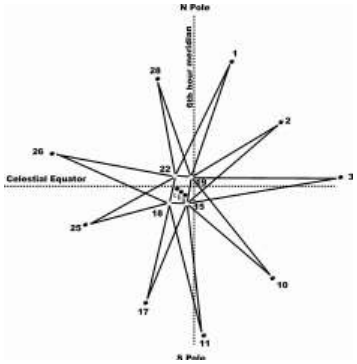

Fig. 4

Bhattacharya has presented the archaeo-astronomy of *Naṭarāja* in various academic forums[4]. N. Raghavan[5] has shown, that, various forms of Śiva icons in the Pallava Temple art (Kailāśnāth c.690-715 A.D., specimen-Tāmil Nāḍū) have homology with the position of the stars in the region of the Orion. However, she makes no mention of our work. In the context of *Naṭarāja,* still a few important questions are left open. For example, the cosmic parable of the torso, the numerous arms and their place of position along with that of the feet have remained unexplained. It is well understood fact of art history that in incipient stage *Naṭarāja* had lesser arms and over a period of millennia or more, he got 10 arms. It is the variable placement of the poly arms in a radial pattern and constant indication of a pair of dancing feet that conjures the *Naṭarāja* icon in the mind of the beholder. It is

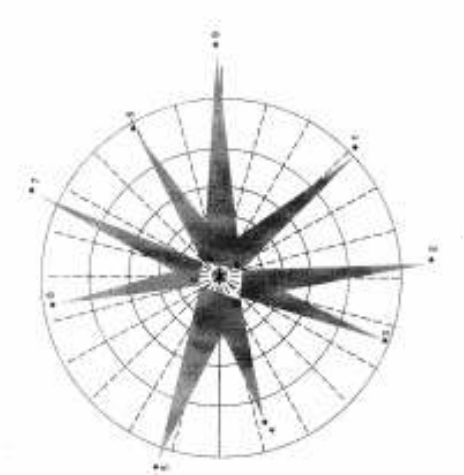

Fig. 5

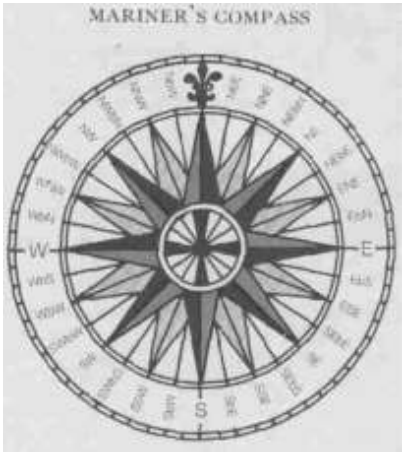

Fig. 6

only in the Tamil editions, *Naṭarāja* has a different posture and is not included in our discussions. The *Naṭarāja* concept is the most spectacular representative (art) form of *Śiva* and has been debated as of far antiquity in India. Besides, the Hindu theo-mythological literature (see Ref.7-9) have consistently related *Naṭarāja* to the Cosmos. Since the Indian repository of dateable *Naṭarāja* icons have 4,6,8,10 and 16 arms, we adopt a multi-disciplinary methodology to briefly discuss if all these aspects have any astronomical connotation and if possible to find correlations with positional astronomy. We therefore, limit our scope to a few select dated archaeology icon specimen of *Naṭarāja*.

Extant editions of the *Naṭarāja* come in various forms and dates. The Asanpat *Naṭarāja* icon (c. 4th century AD with *Brāmhi* inscription), gathered from Mayurbhanj district now preserved in the Orissa State Museum; the Bādāmī *Naṭarāja* in Karṇāṭaka (c.625 AD) that is engraved at rock's edge in a low cave, and the Paraśurāmesvara (c.650 AD) specimens at Bhubaneswar, have 4,16 and 10 arms respectively. The world heritage site of Ellora in Māhāṛāstṛa has numerous poly arm editions dated between c. 9-12th AD. All these pan-Indian specimens have 2 feet and 4,6,8,10 and16 arms, ranging the entire *Śaiva's* iconic art history period of c.7th-8th AD. close up of our Fig. 2 (c.650 AD).

We intend to use Fig. 7 as the platform to co-relate with positional astronomy to validate the historical background of this unique art member. The *daśa bhūja* icon at Bhubaneswar [Fig.7] is an established *Rāj dutta kirti* of the

Fig. 7

*Kaliṅgādhipati** is the work of imperial *pratipālaka par-excellence* of scholars and performing artists and technicians. Therefore, Fig.7 is historically meritfull and is also the representative archaeology of α *Ori*., around which the scientifically generated *Tārakā* the radial pattern and *Nakṣaktra* the celestial compass are also centered, it has the prequalification in archaeoastronomical studies. Moreover, our Fig.7 is of circular format with Rūdṛāksa (*Aleocarpus genitrus*) around it. The Bādāmi *ṣoḍaśa bhuja* icon [Fig. 10], the icons at Kailaśnāth [Fig. 11] and the Ellora [Fig. 12] specimens are all rectangular and are without *Rūdrākṣa*. The Cola specimen [Fig. 13] is circular, without *rūdrākṣa,* is museum kept-c.13th A.D. specimen. Art is *bhāṣā* (lingua). From it transpires *citra kathā* (art dialect). *Citra bhāṣā* can be read by the beholder in his own *lingua,* which was the chosen medium of all civilization for story telling and public instruction. Hence, art parameter is important. In this note, we superimpose our earlier derived Fig.3 and Fig. 4 on various icons of *Naṭarāja* and arrive at Fig. 10 to 18. Fig 16,17 & 18, are three close up variants of Fig. 7. We do this to appreciate the relevance of correlating positional astronomy with *ṣoḍaśa, daśa, and catūr bhūja nṛtya mūrtis* (16,10 & 4 arm dancing icons, respectively) and the *rūdrākṣa maṇḍita golākār* (*Aleocarpus genitrus* enscribed circular, medallion) as indicator of circular sky i.e. the then apparent Cosmos. Each *rūdrākṣa* may signify a very bright star or a constellation as was known to then scientific mind. Similarly, in Fig. 13 the fire

*By 650 AD, the whole of the Indian sub-continent had only two notable sovereigns (i) the *vaiśnava*, Naṛasiṁhavarman alias '*māmalā'* (Lion) the Pallava, the then political power of the territories on the right bank of river Godāvari and (ii) the *śaiva* Mādhavrājā-II of the Sailodbhāva dynasty alias '*Sakala-Kaliṅgādhipati'* (lord of the whole of Kaliṅga) the then political power of the territories on the left bank.

balls that are on the circular rim may represent a star. Therefore, from the perspectives of historical *datum*, background art format and art ethos, Fig.7 merits as a pivotal candidate for our topic.

The Hindu Supreme lord Śiva, in his dance mode (*nṛtya bhaṅgī*) is known as *Naṭarāja* (the lord of dance). In the domain of Hindū thought and expression to no other deity does this epithet apply. Numerous *Āgamas* (advanced works) are equivocal, that Śiva had performed something termed as *Pralaya nṛtya* (deluge dance) following the self immolation of *Śatī* (pre incarnation of *Pārvatī*). The origin of these texts are dated between the c.9th and the c.17th AD. This aspect is not borne out by cognate archaeology (material evidence) of pre c. 9th AD. Rao[7] follows Ananda Coomarswamy[8] in citing the Tāmil *sthala pūrāṇa*, *Thiṛūvacagaṃ* and the Śanskrit *Kālī pūrāṇa*. Satyamurti[9] additionally cites *Cidambaram Māhātmya* to unambiguously indicate, that, as per lore, *Naṭarāja* is said to have appeared twice, to perform *Ānanda Tāṇḍava* (joy abundant), in the centre of the universe. His first appearance being in the forest of *Tārakā* (see Ref.1,p.55). In preparation for our caption, a few pan Indo important *Naṭarāja* icons were visited in-field including traditional *siddhāntims*, Hindu, Buddhist iconologists, and archaeologists and a select secondary sources were considered. It has resulted in the selection of our candidate figures, which make a fair sampling with relation to art format, historical time and place. The *tāla-māna, laya, bhaṅgī mūdrā, abhinaya, bhāva* and *pāripārsika* aspects differ in each of the adduced editions. Even the morphometry of the physic of *Naṭarāja*, differ. The editions allude to regional schools. The corollary is pan India. The cosmic component is another common denominator.

Fig. 8 is that of Leonardo da Vinci's (1452-1519) '*Vitruvian Man',* which relates the human body's proportions to those of the universe. It depicts a pair of identical nude male figures with the torso in superimposed position with arms and legs spread apart at variable angles which all overlap and are inscribed in a circle and a square. The set is sometimes called the 'Canon of Proportions' and as '*Vitruvian Man'*. Leonardo, did not invent it[10]. *Naṭarāja* in Fig. 7 is also nude. In Fig.9 we have attempted a similar enscription. The pair offer good homology. Modern engineers, anatomists and visual artists are of the opinion that Fig. 9 offers more from the domain of engineering, anatomy and nude/body art, part by part or as a whole, respectively. While Fig. 8 is a one dimensional sketch, Fig. 9 is a two dimensional sculpture in bass relief, pre-dating by an order of 860-

875 yrs. D. Bhattacharya and Kelu Charan Mahapatra[11] have discussed the classical dance aspects of Fig. 9. Classical dance has yet not been attributed to the '*Vitruvian'* format.

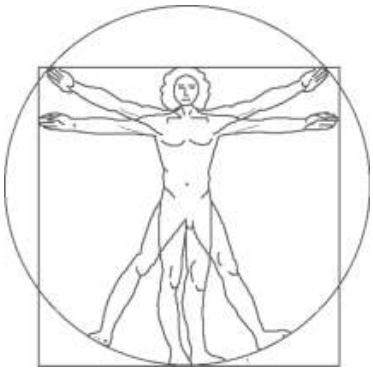

Fig. 8

Fig. 9

In India, *Śiva* was incipiently worshipped as *liṅga*. Lexicons give the meaning of the term *liṅga* as indication and *Śiva* as fact-joy[12]. The term *Śiva-liṅga* is then a conjointed acronym. Among others, one of the perspective that the *Śiva-liṅga* denotes an indication of joy transpiring out of fact. It then is *śiddhānta sammata* (in consonance with astronomy). Historians have earlier ascribed this shrine to the then *śiddhānta* times. Fig. 1 enshrines a *Śiva-liṅga* and whereas the term *Kaliṅga* means cleaver and intelligent[13]. *Citra kathā* may have been intelligently used to hide the technical information from the uninitiated and / or the vile eye. In relation to our caption, *śiddhānta* (ancient naked eye positional astronomy) also has a chance of being reflected in the art of *Naṭarāja* more because of its important placement in the art pool of Fig 2. Bhattacharya[14] has indicated, that, the architecture of the *Śiva-liṅga* is composed of abstract items of geometry and tools for compassing and construction. The temple design incorporates load structure engineering having inflorence of *Śaiva* art and resurgence of *Śaiva* thought. We are of the considered view, that, all *Śiva-liṅga* shrines indicate joy of fact. We know, that the Cosmos is the best qualified fact. We also know, that ancient Indian astronomers considered the cosmos as fact and permanent. In-spite of a plethora of lore and a tome of secondary references averring a cosmic etiology for *Naṭarāja*, no art or archaeology of *Naṭarāja* has so far been scientifically related with the cosmos[15]. This is why, our topic is interesting and relevant.

Fig. 10 is that of Pallava period *Naṭarāja* (c.710 AD). We may imagine α *Ori*. or ε *Ori.* as the navel of *Naṭarāja*. We have drawn imaginary lines emanating from the navel which terminate at the position of the palms and the two feet. We note a radial type plan.

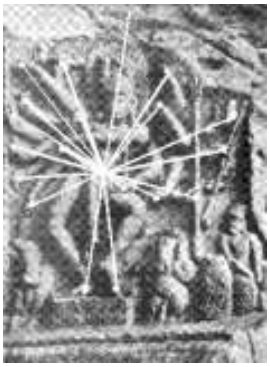

Fig. 10

Similar exercise has been attempted for Fig.11, Pallava (c.7th A.D.), Rāṣṭrakuṭa (c.9th AD) and Fig.12, Cola (c.13th AD, National museum-Delhi) period specimens. In our seminal paper *Tārakā* [see Ref.1, F.6,p.67] we have traced a similar pattern in the ground architectural plan of the *Hinayāna* monuments as are at Bhubaneswar (Orissa). It is reproduced as Fig. 14 for topical levity. On

Fig. 11

a star chart these variation can be achieved by variable selection of bright stars that are around α *Ori.* or ε *Ori*. Of the 4 Deccan specimens in 3 compositions [Figs. 11,12,13] of *Naṭarāja* we may note that the arms/stars are on the right side of the icon (*dānabrata*). In the *hinayāna* scheme they are to the left (*bāmābrata*). Fig. 15 is that of Āśānpāṭ Naṭarāja (c.4th AD, Mayurbhanj). It has 4 arms/stars each on either side of the torso, with both the feet on the ground. In Fig.10 i.e. Bādāmi Naṭarāja (c.7th AD) the 16 palm position have been marked by 16 lines. Fig. 10 and Fig. 15 offer (better) radial formats. Disposition of arms and location of palms are apparently better balanced.

Fig. 3 is mathematically derived celestial position of 27 bright stars in the current epoch in relation to α *Ori.* If we consider only the circular medallion of *Naṭarāja* as in Fig.7 and superimpose Fig.3 on it coinciding α *Ori*. with the navel of *Naṭarāja*, and the north-south 6th hour meridian coincident with the icon's temple passing through the 3rd eye, we arrive at Fig16. It offers good indication to proceed further. In Fig. 17 we present the one-to-one correspondence of the10 palms, the head and the feet duo (total 13). We may note that balance is the high point of this format. It also indicates that all the limbs demarcate variable sections of the arc, and also form various geometrical pattern inscribed within a circle which is the conjectural visible span of the night sky. In relation to the navel alias *bindū* (center point) helps in better appreciation of the poly arm *Naṭarāja* and the embedded cosmic parable via *citra kathā*. We may note that the iconic variations arise out of number of hands, their place of position along with that of the feet. In Fig. 7 we may note a additional part ring of *rūdrākṣa* evolving out of the full circular ring of *rūdrākṣa*. This part ring can also wishfully be conjectured

Fig. 12

Fig. 13

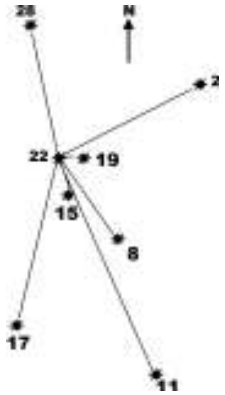

Fig. 14

Fig. 15

as representing the variable aspect of star α *Ori.* Again, in Fig. 7 had a coat of *vazra lepa* (red colour- *thunder coat*). The faithful and the indulgent may have co-related this with the red hot aspect of α *Ori*., and as allusion to *Rūdra* (*Śiva's* primordial star), of the constellation *Kālapurūṣa* (time embodier). The Orion's trapezium (Fig. 4) may have been the inspiration behind *Śiva's dambūra* (Kettle drum, which is now damaged). Above his head, *Naṭarāja* holds a long mono hooded snake. On a star chart this can be akin to the constellation *Āhi* (Hydra). On ground, its architecture has interesting homology with the ancient river Gandhavati *alias* the present *Gaṅgūā*, which flows by circumnavigating the shrine by a kilometer to the east and the south. In Kannāḍa, Māhār and Kaliṅgiya specimens in particular, we note the concept of *Ākās Gaṅgā* (milky way) is conspicuous, by absence, which is noted in Cola specimens. All these also underscore components of regional schools of *cintā-o-cetanā.*

If we superimpose Fig. 4 on Fig. 7, we arrive at Fig. 18. The format offers good homology with Fig. 6, the modern compass.

Table I gives the constituent members of our celestial compass. It is to be read clock wise from the top. Astronomically, in the current epoch, with ε *Ori*. (*Anirūdha* – a synonym of *Śiva*), is at apparent zenith of the Celestial Equator. One of the viable co-relationing is as follows. Orion forms the hub, while the nine wide spread limbs of the *Naṭarāja* mark important stars as are visible with naked eye from either hemisphere[16]. This is the homology. It is crude, crass, yet very significant. Siddhāntically, this constitutes *śambhū* (possible).

Fig. 16

Fig. 17

In Figs.16-18 *Naṭarāja* is *daśa bhūja* (10 arms), which are flung at equidistance on either side of the torso. In contrast to elsewhere, the *Kaliṅgīya*, *Naṭarāja* is nude and sports a *ūrdha liṅga* (erect phallus) and whereas he is ornamented and crown beset. The *ūrdha liṅga* is then a well considered component of *citra kathā*. From our perspective, it may be symbolic of bareness of the *Kālapūrūṣa* (time & space) and its ascendant order in the present epoch. In Fig.7, 10 11& 12, his countenance is *saumya* (serene). This may allude to the equanimity of the space. Fig.7 is located centrally inside the medallion (circle) that has 77 threaded beads, which is symbolic of a circular garland of *Rūdrākṣa*. *Rūdrākṣa-mālā* is used by the Hindūs to mark time and as abacus. The number 77 may allude to prominent constellations or very bright stars then known or to something that as yet, has remained undeciphered. In Fig. 13 the *bhāva* of the *avinaya* (ethos of act) is *rūdra* (terrific). The fire balls on the circular rim adjuvant

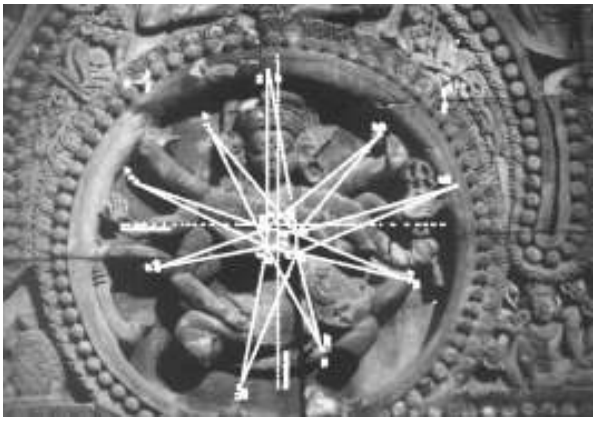

Fig. 18

Table I: Members of the *Nakṣatra* [as in Ref.I, F-7, T-IIb, pp.68-69]

Western Name	Hindu Name
Dhube (α U Maj)	*Kratū*
Regulus (α Leo)	*Maghā*
Not Known (β Leo)	*Fālgūni*
P. Square (α peg)	*Phakhirāj*
S. Crux (α Curcis)	*Triśaṅkū*
Eomalhaut (α Eri)	*Matsyamūkha*
Cetus (β Cetu)	*Not Known*
Alpheratz (α Andromeda)	*U. Bhadrapāda*
Cassiopeia (α Cass)	*Kāśyapa*

a ethos of fire spewing (juvenile) stars ? An in-tandem study of our Ref. No.1, 2 and 5 will help the reader to grasp the profundity of the topic and the joy in it. In brief, we may state, that in *Tārakā*, we have proven, that, a rare celestial coincidence is current in the present epoch, which allows imaginary visualizing of all our generated formats with the naked eye (in night sky). Such allignment with the precession of α *Ori*., across the celestial Equator, is not impossible a few centuries post present.

Conclusion

The concept of *Naṭarāja* incorporates the region of the Orion and as well the entire span of the night sky as is apparent from the geographical domain south of $+20^0$ lat. of the Indian Sub-Continent. It is also in consonance with archeological findings, that *Naṭarāja* icons are less common to the north of $+20^0$ lat. More importantly, all these scientifically corroborates the learned contentions of the long line of Hindu theistic scholars, practitioners, the myths and the folk as are in the theo-mythological texts about the influence of stars and constellations in the inconography of *Naṭarāja*. Vis-a-vis even by the 1st part of the c.7th AD, *Naṭarāja* archaeo-astronomical practices were a pan India phenomena. Regional concepts thoughts, and levels of attainment in astronomical sciences and performing arts have been articulated via the vehicle of such *Naṭarāja nṛtya mūrtis*, which inject peculiarity (also) tantamounting to signature of regional schools (identity). A historical period based inter-region affinity is also noticeable. *Naṭarāja mūrtis* apparently position themselves as tools in archaeo-astronomy and in the history of science and art. Again, precession and latitudinal position alter apparent star location grossly, which in turn may have induced variability in iconic representation. We

also note the germ of the idea of the modern compass ingrained in the scheme. This points in the direction of nature based inspiration. Figs. 1 to 18 do not support any Buddhist etiology. We also feel, that (among other issues), each type of *Naṭarāja* icon, marks a point in time in space. Each edition hides more than it reveals.

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