Why Sārus Cranes epitomize Karuṇarasa in the Rāmāyaṇa

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Abstract

By correlating literary evidence, avian ethology and neurophysiology I will try to demonstrate why Vālmīki chose a pair of Sārus Cranes, and not any other avian species, to epitomise grief and sorrow in the Rāmāyaṇa. This choice illustrates the importance of personal experience of the living reality (behaviour of Sārus Cranes); but the grief, śoka*, as experienced by Vālmīki, became in later critical literature, the* rasa *of* karuṇa*, the aesthetic appreciation of grief, as suggested by Ānandavardhana and explained by Abhinavagupta. By emphasising the central importance of affective states (*sthāyibhāvas*) in life as well as in the arts (*rasas*) Vālmīki, Abhinavagupta and Ānandavardhana appear to have had a perception of the human condition that is consistent with recent developments in affective neuroscience; and thus it is the pitch and the tonal quality of the cries of grief that convey the depth and universality (*sādhāraṇatva*) of the emotion.*

Cranes in Indo-European, Greek and Indian folklore and literature

As Sārus Cranes are vocally very expressive, form life-long pair-bonds and display complex and sophisticated social behaviour they are ideally suited to epitomise the notion of grief and sorrow in circumstances where one of a pair has died.

The *krauñcavadha* episode was supposed to set the tone of the epic; so the composer had to choose a bird whose social life would be familiar to the listeners; and as the human population at the time of the composition of the Rāmāyaṇa was very small and thus wetlands were more extensive than they are to-day, the Sārus Cranes were common.

Krauñca originally designated the Eurasian Crane. After the Indo-Iranian (II) speaking groups dispersed into the Pañjāb the term *krauñca* also came to designate the Sārus Crane; who later became known exclusively as *sārasa*; an etymon which may, like *krauñca*, have an onomatopoeic origin as the vocal expressions of cranes is their most characteristic feature.

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Sārus Cranes in Sanskrit literature

The recognition of the ability of non-human animals to express sorrow is typified by the use of the Sārus Crane as a simile for sorrow in the Rāmāyaṇa. The emphasis in the description in the epic is placed upon the sorrow and compassion of Vālmīki so there must have been an immediate state of affinity between the Sārus Cranes and the sage.

The basic cladistic affinity between species; and the crucial rôle of affective states across clades

Fundamental emotional states, *sthāyibhāva*s, have corresponding aesthetic experiences, *rasa*s. The aesthetic theory of *bhāva* and *rasa* state that there are ten basic emotions, which form the cornerstones of artistic enterprise and of artistic appreciation; eight of these affective circuits, including grief and sorrow, have been identified neuroanatomically as basic motivators for behaviour.

The reproductive neurotransmitter systems in cranes appear basically to be analogous to the corresponding systems in human and non-human mammals so it is likely that the affective response of the composer of this *sarga* came as a reaction to interspecific stimuli.

Basic empathy, *tanmayībhāva*, and *sneha*, affection. A state of close affinity with other living beings such as trees and animals seem natural according to for example the Rāmāyaṇa and Abhijñānaśākuntala, so the saint's reaction would have exemplified the zeitgeist.

Degrees of grief, *śoka*, and the transformation of grief into the *rasa* of *karuṇa*. The *anubhāva* of the Sārus Cranes' mournful cry indicates the depth of grief in the *nirapekṣabhāva* of *vipralambhaśṛṅgāra*, and this inspired Vālmīki to compose the Rāmāyaṇa, regardless of whether his reaction was determined by yogic *tāṭasthya*, emphatic identification with the *vāsanā*s of another being as in *karuṇa* or by the *sthāyibhāva* of *śoka*.

Sorrow and separation distress calls. The timbre and pitch of the voice are capable of carrying greater emotional impact than any choice of words so the composer of the *krauñcavadha* episode emphasised both the depth and the universality of sorrow by choosing a monogamous pair of non-human animals with an expressive vocal register to epitomise *śoka* and *karuṇa*. The influence of *śoka*/*karuṇa* can be explained as separation distress calls, sad music and tales of sorrow, or of separated lovers, seem capable of reaching greater emotional depth in humans than cheerful and contended ones.

1. On account of their remarkable ethology cranes figure prominently not only in Indo-European literature and folklore but also in the legends and art of China, Japan, Australia and North America. Three species of cranes are comparatively well-spread in India, Demoiselle Cranes,[3] Eurasian Cranes and Sārus Cranes. Both the Demoiselle Crane and the Eurasian Crane are winter visitors in India while Sārus Cranes breed in North India. When the Indo-Iranian speaking groups dispersed into the Pañjāb they were familiar with Demoiselle Cranes and Eurasian Cranes whose etymon **ger*- reflected in most Indo-European languages, in Vedic/Sanskrit is *krauñca* as the usual change from PIE **g* to *j* in Vedic becomes superseded

[3]Species-specific denominations are written with capital letters; e.g. 'Sārus Cranes,' but 'cranes,' i.e. any species of cranes.

for onomatopoeaic reasons; the term *krauñca* was during the course of several centuries also used with reference to the indigenous Sārus Crane, who, however, later came to be designated by the term *sārasa*.

Vālmīki began his tale by being inspired by the sorrow, *śoka*, of witnessing the grief of a female Sārus Crane as her mate was killed by a hunter; and the Rāmāyaṇa is according to Ānandavardhana and Abhinavagupta pervaded by the *rasa* of *karuṇa*, empathy or the aesthetic experience of sorrow. To substantiate why a Sārus Crane could display a state of grief distinctly enough to move Vālmīki to such an extent that he became inspired to compose the Rāmāyaṇa I shall begin with a short description of the ethology of Sārus Cranes.

2. The ethology of the Indian Sārus Crane, *Grus antigone*. Hindi: *Sārus*

The average height is 156 cm, but it may be 180 cm, and the Sārus Crane is thus the tallest flying bird in the world. The wing span is about 246 cm. The head and the upper neck are naked and hence orange-reddish, though in the breeding season brighter red. A broad ring of white feathers separates the bare part from the bluish-grey feathers of the lower neck. The primaries and primary coverts are dark grey; and the general plumage grey, but lighter on the belly than on the back. The tail feathers are pale grey and bushy, the legs pinkish and the bill pale greenish with a dark tip. The sexes are alike but the female is slightly smaller than the male (monogamy tends to even out sexual dimorphism); the breeding season stretches from July to April, but peaks in July, August and September. (Ali and Ripley 1983, II: pp. 141–143).

Being dependent on the presence of wetlands the Sārus Crane moves locally to avoid drought though the behavioural pattern indicates sedentary preference. Sārus Cranes occur today in Uttar Pradesh, Rājasthān, Gujarāt and Haryāna, but only sporadically in Madhya Pradesh and Bihār; they used to occur all over the Subcontinent, from Sind in Pākistān throughout the Gaṅgetic plains to Bānglādesh as well as in the more arid and semi-arid plateau of the Deccan. In India they are now only found where traditional agriculture still is practised (Meine and Archibald, 1996).

Their food consists of fish, frogs, lizards, grasshoppers, insects and marsh plants. Sārus Cranes affect cultivated and well-watered plains, marshland and *jheel*s. Though congregations of dozens of birds occur in the winter Sārus Cranes usually keep apart in pairs. They pair for life and their mutual faithfulness and devotion have become legendary; and, partly because of the Rāmāyaṇa, Sārus Cranes are protected by popular sentiment where tradition still holds sway. If one of a pair is killed the survivor haunts the scene of outrage for weeks calling distractedly, and some bereaved birds have been known to pine away and die (Ali and Ripley 1983, II: pp. 141–143).

The vocal repertoire of Sārus Cranes is as complex as that of Eurasian Cranes, but the notes are deeper, more pronounced and resonant. The most conspicuous call consists of a very far-reaching trumpeting which sounds like 'garrrrooa-garrrooa-garrrooa'. The unison call is usually performed by a pair as a duet, often at dawn and during moonlit nights (Walkinshaw, 1973: pp. 199 and 208). The moment one bird begins his or her mate immediately answers. The necks are fully stretched out and the bills are pointing towards the sky while the body feathers are ruffled and both birds seem to vibrate with excitement. This unison call, which resembles the unison call of the Eurasian Crane (Walkinshaw, 1973: p. 37), seem to strengthen

pair-bonding by synchronising reproductive rhythms; besides it also functions as a display of affection. The call also indicates warning, greeting, and a mutual assurance about continuous close presence. The alarm call is a loud shrill cry.

The dance consists of jumping, bowing and circling movements; the two birds stand in front of each other with their necks swinging to and fro so that their bills sometimes touch. One of the birds may jump up into the air and descend with flapping wings (Walkinshaw, 1973: p. 208). To initiate copulation the female stretches her neck upwards and turns away from the male who approaches quickly and steps up on her back while moving his wings; after the copulation he jumps up over the head of the female (Walkinshaw, 1973: p. 201). Otherwise the male may begin by calling shrilly with partly lifted head, the female then adopts the same posture and follows the male a while before she turns round; the male calls again shrilly; the female spreads her wings out and the male approaches her slowly and emits a low-pitched call; the female retracts her neck and points the bill downwards. With flapping wings the male then steps up on her back as she bends slightly forward; then both birds are silent, but after copulation they dance and emit unison calls (Mukherjee, 2002).

The Human population of India in 1600 AD was according to one estimate 142 and to another 144 millions (Habib, 1982: p. 165) i.e. about 11.5% of the present estimated population for the entire Subcontinent; but it was, according to the available calculations, 31 million around 200 BC and 41 million in 200 AD (McEvedy and Jones, 1978; pp. 182–189). The relative rate of increase in population, based on relatively certain estimates from 1600 to 1900, matches however the more uncertain assumptions from 400 BC to 1600 AD (McEvedy and Jones, 1978: pp. 182–189). With a population of 41 million around 200 AD the population density at the time of the composition of the Rāmāyaṇa would have been around 25 times less than it is today. Furthermore the population has always been most concentrated in the wetlands. Around 2000 BC there might have been 5 million in the Gaṅgā-Yamunā doāb against 1 million in the Deccan (McEvedy and Jones, 1978: p. 182); and the deserts in the northwest were smaller than they are to-day as the monsoonal rainfall has diminished (Bryson and Swain, 1981; Singh et al., 1974). Since the climatic conditions were more humid and the cultivated areas much smaller crane habitats would thus have been considerably more extensive than they are today. (cf. Mukherjee et al., 2002b, 2001) So these considerations reinforce the impression of the extent of both flora and fauna as described in the Rāmāyaṇa and, e.g. in Kālidāsa's Abhijñānaśākuntala.

3. Etymology of *sārasa*

Because of a need to distinguish between the cranes (Demoiselle, Siberian and Eurasian) that left in spring to return in autumn and the crane (Sārus) that remained present throughout the year, an appropriate word arose either spontaneously or as a Sanskritisation of a Drāviḍian or a Muṇḍa etymon, or indeed of a lost autochthonous designation, perhaps affiliated with the language strata in north-west India that have precipitated into Hindī to form between 31 and 34% (i.e. 84–93 words) of its agricultural and horticultural terms (Masica, 1979). The Hindī *Sārus* comes from Sanskrit *sārasa* (<*saras*, Mayrhofer, 2001: p. 510), which presumably means 'the crane who affects swamps and jheels'; or rather 'the swampy' or 'the lake-like one,' a designation that could fit any crane and indeed any waterfowl such as the Watercock/Kora

(*Gallicrex cinera*), the Indian Moorhen (*Gallinula chloropus indica*), the Indian Purple Moorhen (*Porphyrio porphyrio poliocephalus*), the Pheasant-tailed Jaçana (*Hydrophasianus chirurgus*) or the Bronze-winged Jaçana (*Metopidius indicus*). Like Sārus Cranes they are all characterised by building their nests in or in immediate proximity to water. However, *sārasa-* means 'crying/calling out' (*sa* + √ *āras/-ati*, 'shout/s'), and *sārasyam* 'a call/cry,' cf. for example *sārāva* 'crying,' and *sārambhaḥ* 'angry talk'. An onomatopoiesis would in the case of such a vocal species as the Sārus Crane be more likely to arise naturally than the indistinct term 'the jheel-affecting one'. Though there apparently is no gloss in any Drāviḍian or Muṇḍa language which might suggest an agglutination of crane-diagnostic phonemes like *sārasa* it would be reasonable – if the word is not a typical Sanskrit construction like *hast-ī/-inī*, 'the handed one' – to expect an autochthonous origin as the Sārus Crane is endemic to India. The Drāviḍian migration preceded the II speaking tribes by at least one thousand years (McAlpin, 1979), i.e. around 2500 BC or earlier, when the Western Group of Mesolithic Austro-Asiatic speaking hunter-gatherers or Neolithic farmer-pastoralists already were well established in the Subcontinent.

3.1 The ethology of Sārus Cranes as reflected in classical Sanskrit literature

The term *sārasa* occurs with regular intervals in Sanskrit literature, e.g. in the Mahābhārata. (1933) 1.138.11:

ete ruvanti madhuraṃ sārasā jala-cāriṇaḥ /
'These water-affecting Sārus Cranes are trumpeting sweetly',[4]

but it is especially prominent in the poems of Kālidāsa who had a *sahṛdaya*'s sense of empathy (*tanmayībhāva*) with Nature; e.g. in Meghadūta 32 (Kālidāsa, 1969):

dīrghīkurvan paṭu madakalaṃ kūjitaṃ sārasānāṃ pratyūṣeṣu sphuṭita-kamalāmoda-maitrī-kaṣāyaḥ / yatra strīṇāṃ harati surata-glānim aṅ gānukūlaḥ siprā-vātaḥ priyatama iva prārthanā-cāṭu-kāraḥ //
'So lengthening the Sārus Cranes' deep calls of melodious joy the Siprā [River] breeze – from [its] gladdening union with bursting Lotus [flowers] – steals away – dawn after dawn – the weariness after love-making in women – like a lover skilled in stirring desire – by following the slopes of [their] limbs.'

Daniel Ingalls (Ānandavardhana and Abhinavagupta, 1990: p. 659) translates *sārasānām* as "of paddy birds", i.e. the 'Indian Pond Heron' or 'Paddybird', *Ardeola grayii*, Hindī: *Andhā baglā*; but this heron, though usually silent, utters a harsh high squawk (Cramp *et al.*, 1977, I: pp. 278–279) or a high harsh croak (Ali and Ripley 1983, I: p. 63). Furthermore the calls of Pond Herons are not very far-reaching, and there is no reason to suppose that Kālidāsa should refer to any species other than in the Raghuvaṃśa 1.41 (Kālidāsa, 1972) where he writes:

sārasaiḥ kala-nirhrādaiḥ
'by the soft/sweet-calling Sārus Cranes';

[4]The translations are mine.

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this is an epithet that could not fit the croaking of a Paddy Bird. Ṛtusaṃhāra 19 (Kālidāsa [?] 1967) has:

vipanna-mīnaṃ druta-bhīta-sārasam
'the fish has died, the frightened Sārus Crane has fled'

(from the lake because of drought); this would refer to local movements; the Ṛtusaṃhāra. 3.8 (Kālidāsa, 1967):

kādamba-sārasa-cayākula-tīra-deśāḥ
'[rivers] whose bank-sides are teeming with flocks of Sārus Cranes [and] Grey Lag Geese'

(in the Autumn after the rainy season); also Ṛtusaṃhāra. 3.16 (Kālidāsa 1967)

Sampanna-śāli-nicayāvṛta-bhūtalāni
svastha-sthita-pracura-go-kula-śobhitāni /
hamsaiḥ sasāra-sakulaiḥ pratināditāni
sīmāntarāṇi janayanti nṛṇāṃ pramodam //

'The stretches towards the horizon – [where] the fields are densely covered with ripening rice, [and which] are charming with large herds of peacefully standing cows, [and] resounding with flocks of Sārus Cranes and geese – arouse deep joy in men'.
Sārus Cranes thus evoke joyful and sympathetic associations, but it is especially their melodious and resounding unison calls that are particularly distinctive.

4. The choice of Sārus Cranes

Could Vālmīki (or the *kavi* who composed the Bālakāṇḍa) have found another pair of living beings to epitomise the universal notion of sorrow? The choice of a pair of non-human animals would make the universality more striking than it would have been by choosing a human couple. Especially two criteria had to be fulfilled: 1) monogamy; 2) an *anubhāva* that spoke across clades to leave no doubt about the extent of the sorrow. Such an interspecific *anubhāva* is a characteristic of poetry, and is for example succinctly expressed by Tomas Tranströmer (2002) in 'Från mars -79,' where words, words, words (semantemes) is contrasted to the language (*anubhāva*) of the deer's track in the snow.

Mammals can express sorrow, e.g. wolves, cats and elephants. Both elephants, dolphins (see Tyack, 2000: p. 275) and cats use 'touch,' *sparśendriya*, and vocal expressions but they are not monogamous; birds use touch to a lesser extent but they are very vocal, and in some cases monogamous. In Sanskrit literature the 'Barheaded Goose,' *rājahaṃsa*, *Anser indicus*, Hindī: *Rāj hans* (cf. Hammer, 2003: pp. 311–317) and the 'Brahminy Duck,' *cakravāka*, *Tadorna ferruginea*, Hindī: *Chakwa*, are famous for monogamy (although neither the Barheaded Goose nor the Brahminy Duck breed in India), but their calls appear to be less able to carry affective tones that are perceptible to the human ear than the calls of cranes. Birds such as thrushes whose songs are musical, have calls that are well-suited to indicate alarm or anger but not sorrow. Cranes however, are both extremely monogamous and capable of lending affective quality to their calls. Besides, a species that bred in India would, if the killing had to take place while they mated, be a prerequisite. The Demoiselle, the Siberian and the Eurasion Crane

winter in India. The only species of cranes that breeds in India is the Sārus; furthermore Sārus Cranes tend, in the breeding season, to keep apart in pairs. Besides, the behaviour of the chosen species had to be easily recognisable to the listerners of the Rāmāyaṇa; a *rara avis* would not do.

The behavioural conduct or sociogram of Eurasian and Sārus Cranes has been analysed to consist of about sixty different patterns. The vocalisations they share include peeping, food-begging, nesting-call, contact-call, pre-flight-call, flight-call, alarm-call, guard-call, unison-call, location-call, stress-call, distress-call, moan, hiss and pre-copulatory call; only the Eurasian Crane has a copulatory call. Of twenty-six agonistic displays, such as ruffle-bow and ventral-preen, they differ in three displays but share twenty-three. Concerning pair related behaviour they share all fifteen traits. This expressive diversity (which encompasses more than 60 social ethons per species) places cranes at the apex of social complexity amongst animals at least regarding innate social displays (Ellis et. al., 1998) though an upper limit of fifty different displays has been suggested for non-human animals (Hailman, 1977: pp. 33–34 and pp. 262–264). This explains why the transfer of the term *krauñca* from the Eurasian to the Sārus Crane was ethologically natural, and it shows that the choice of cranes to illustrate universal sorrow was based on factual observation. The poet who composed the stanzas in the *Rāmāyaṇa* must have been familiar with the behaviour of cranes and he must have witnessed the killing of a male Sārus Crane during mating and the ensuing reaction of the female – for *pratibhā* is the ability to sense how episodes of experience can be rearranged in a dramatic and artistically poignant way. It is the degree of the reality of the lived experience that determines the authenticity of the artistic expression, but it is also precisely that which determines the listener's or the reader's subsequent understanding or interpretation.

5. The Sārus Crane and the Rāmāyaṇa

The Bālakāṇḍa, which consists of several heterogenous episodes, seems to have been compiled during the first three or four centuries AD (Brockington, 1998: pp. 374–385), but it is conceivable that the themes of some of these episodes might have been composed at an earlier date. The geographical horizon is still mainly defined by the Gaṅgā-Yamunā doāb and the northern part of the Vindhya Mountains – areas which would have been heavily affected by Sārus Cranes. The celebrated *krauñcavadha* episode describes how a hunter killed the male of a pair of mating Sārus Cranes in the presence of the sage Vālmīki; and how his spontaneous indignation at this outrage inspired him to curse[5] the hunter and compose the Rāmāyaṇa. Bālakāṇḍa 1.2.8 b. Vālmīki (1982):

Vicacāra ha paśyaṃs tat sarvato vipulaṃ vanam //
'Looking everywhere he roamed verily around in the vast forest'.

The attentiveness of the sage is undivided attentiveness, i.e. *ekāgratā*, as in yoga and meditation; *vipulaṃ vanam* suggests infinity or infinite variety, i.e. great creative Nature; and *tat sarvato* may indicate a state akin to *adbhutarasa*, 'the aesthetic experience of wonder' and 'awe' or rather a combination of both, i.e. 'ferly'.

[5]Curses function as a standard and efficacious device of retribution in all situations, and they can be very powerful provided the person cursed sincerely believes in the power of the curse; cf. for example voodoo.

1.2.9

Tasyābhyāśe tu mithunaṃ carantam anapāyinam /
dadarśa bhagavāṃs tatra krauñcayoś cāru-niḥsvanam //
'But there in proximity to him the Blessed [Sage] saw an inseparable, dancing [and] beautifully calling pair of Sārus Cranes'.

It is likely that *carantam* indicates a mating dance rather than mating as both birds are calling and as the male Sārus Crane has a pre-copulatory call but no copulatory call. In connection with *mithunam*, *carantam* suggests interdependent motion rather than merely 'wandering about' while at the same time hinting at an affinity with the sage as he roamed around (*vicacāra*). At the time when the Rāmāyaṇa was composed the wealth of Nature was all-pervasive, apart from the agricultural areas around the villages as delineated in for example the Gāthā Saptaśatī. Furthermore in the absence of hunting, even though that occasionally was practised by local tribes, animals behave with indifference towards humans, i.e. they adopt the same behaviour as they display towards other animals whom they do not fear or with whom they have no reason to associate. *Anapāyinam* points to the life-long pair bonding of Sārus Cranes. As Sārus Cranes, because of the influence of the Rāmāyaṇa, have been protected in many areas they may be approached closely even to-day; though this attitude now seems to be disappearing rapidly (Borad *et al.*, 2002). Prior to the Rāmāyaṇa it is difficult to ascertain any special appreciation of Sārus Cranes.

1.2.10

Tasmāt tu mithunād ekaṃ pumāṃsaṃ pāpa-niścayaḥ /
jaghāna vaira-nilayo niṣādas tasya paśyataḥ //
'But while he was watching, a hunter, haunted by malevolence [and] intent on evil, killed the self same (*ekam*) male off from the pair'.

This stanze depicts a state where the birds are mating. They are conceivably aware of the presence of Vālmīki but not of the *niṣāda*, who probably was a member of one of the aboriginal tribes of hunters and gatherers who are disparaged by orthodox Hinduism. The saintly attitude of Vālmīki is suggested as the birds are not afraid of him; but the hunter is probably stalking them from a distance while their natural vigilance is diminished because of their excited state.

Leslie, (1998) assumes that the hunter kills the bird for food, but it could also be on account of the feathers (cf. Gāhākosa 1980/1988, stanza 373). As cranes have a lifespan of more than fifty or sixty years the majority of the birds would be exceedingly tough and it is hardly possible, in the field, to distinguish between old and young birds; however immature indivduals are easily recognisable as their entire head and neck are covered with buffy feathers (Walkinshaw, 1973), but they do not display mating behaviour.

The tragedy here is partly comparable to the legend of 'The Phoenix and the Turtle.' Two inseparable lovers, epitomised as birds, are separated and/or killed by evil persons (see Finnis and Martin, 2003). The male crane would be comparable to the Turtle, who dies first, the female to the Phoenix; and the 'Foul precursor of the fiend', to the *niṣāda*. The theme might display a universal pattern or perhaps it suggests that there are parallel situations that are bound to occur in any culture. For example the illustration Finnis and Martin have

chosen, is a 5th century BC Roman mural on a bed of roses which clearly depicts a crane. Both the Roman mosaic and the choice of illustration emphasise the impact cranes have had on the human imagination; and it is no coincidence that Shakespeare – given the basic uniformity of human nature, diachronically as well as synchronically – again and again had to commemorate the condition of the greatest affective impact, namely the sadness of separated lovers, especially if in *nirapekṣabhāva*, 'a state without hope' (see 10.1).

1.2.11

tam śoṇita-parītāṅgaṃ veṣṭamānaṃ mahītale /
bhāryā tu nihataṃ dṛṣṭvā rurāva karuṇāṃ giram /
'But seeing him struck down, with [his] body covered in blood, [and] writhing about on the ground, the female burst out in a piteous wailing'.

Cranes are exceedingly sensitive even to minor stress factors as Gee and Russman (1996) point out repeatedly – so the killing of her mate would have had a devastating influence on her affective state. As the female is only slightly smaller than the male, but has a longer tail, Vālmīki's immediate gender identification would probably have been based on behavioural traits rather than on external characteristics. The pivotal point here is the *anubhāva* expressed in *rurāva karuṇāṃ giram*. After 1.2.11, the MSS Dt, D 4,6,8,9,14 and S (except M4) have:

viyuktā patinā tena dvijena sahacāriṇā
tāmra-śīrṣeṇa mattena patriṇā sahitena vai //
'[To be] separated from him, [her] companion, mate/lord (and) bird with the copper-red head [who used to be] so excited with outstretched wings'.

This distinction clearly reinforces the notion of mating behaviour. The stanza is noted in the critical edition as an interpolation, but as the MS (in the generally trustworthy southern [S] recension) M1 is from 1512 and the MS M2 from 1690; and as the description intensifies the female's grief and thus deepens the impression, the verse fits the context and need not necessarily be spurious.[6] However it seems to be forced because of the monotony of the instrumentals; but that may not mean much in view of the precision of the observation for, especially in oral poetry, patches become unavoidable – *quandoque bonus dormitat Homerus*. Regardless of this it proves that the author of the lines had no doubt about the species of the bird Vālmīki (if indeed 'Vālmīki' did not compose the verse himself) saw as *tāmraśīrṣeṇa* 'with copper-red head' and not with feathers, is characteristic as a Sārus Crane has no red feathers. The cause of the red colour is blood – seen through the naked skin – as the cheeks are devoid of plumage. In the Abhidhānacintāmaṇi, Śeṣa, Str. 1328 Hemacandra (1972: 441) describes the Sārus Crane as

go-nardo maithunī kāmī śyenākhyo (= śyenākṣo) rakta-mastakaḥ
'the cow-bellowing, the paired, the loving, the falcon-eyed, the red-headed'.

[6]A critical edition is a rather artificial product in the case of oral poetry which basically is an open joint venture. As the nucleus of the Rāmāyaṇa gradually grew individual poets added, changed and omitted *śloka*s as they wanted within the given framework of the epic. To establish an Urtext is impossible – even if it existed which is doubtful as there probably were different recensions of an epic theme which gradually grew in scope as it was retold, learned by heart, changed subconsciously or deliberately, forgotten and reinvented. Such poetry is agglutinative and anonymous. Hence the only valid criteria for keeping or omitting a *śloka* are its intrinsic artistic values.

In his commentary to Meghadūta verse 32 (Kālidāsa, 1969) Mallinātha likewise has *maithunī*, *kāmī* and *gonarḍaḥ*, so these epithets must have been widely accepted. Taken in conjunction they fit the Sārus Crane better than any other avian species.

Leslie (1998) states that this *śloka* – though probably spurious – is crucial for the correct identification of *krauñca* as a Sārus Crane. However *mithunaṃ carantam anapāyinam* and *cāruniḥsvanam* in 1.2.9 are diagnostic. Both the birds are calling sweetly/musically, *cāruniḥsvanam*; they are moving around relative to one another, *carantam*, and they are inseparable, *anapāyinam*. This leaves two possibilities, the Eurasian and the Sārus Crane, and on account of 1.2.14 *kāmamohitam*, 'impassioned by love-making' it has to be the Sārus Crane as the Eurasian Crane does not breed in India; and neither do the geese that are so famous for marital constancy in Sanskrit poetry.

The repeated reference to a sweetly singing bird in the various translations (which – like a gloss – reveals the image that arises in the mind of a careful reader) signifies that the concept of the characteristics of the species are rather vague. Probably associations to such melodious *Turdinae* as the Grey-winged Blackbird, *Turdus boulboul*, the Malabar Whistling Thrush, *Myiophonus horsfieldii*, or the Malabar Shama, *Copsychus malabaricus*, are aroused.

Though the exact sense remains doubtful the phrase *mattena patriṇā sahitena vai* constitute a reference to the spectacular mating behaviour of Sārus Cranes. And this is indeed noticed in the Tilaka and Śiromaṇi commentaries, as pointed out by Masson (1969). The Tilaka commentary (Vālmīki, 1888) has *sambhoga-kālatvād vitata-pakṣavatā* "with the wings spread out as appropriate to treading". This observation of gruiform behaviour matches Mukherjee's (2002a) figures 'Cf, Cg, Ch' of mating Sārus Cranes as well as the description of 'Pair related behaviour, F Copulation' as given by Ellis *et al*. (1998). Furthermore, *dvijena* in this stanza may be a *śleṣa* – though this figure is rare in the Rāmāyaṇa – to emphasise the notion of kinship between the Cranes and the *kavi*; however, it might not be a conscious choice but a periconscious echo.

1.2.12

tathā tu taṃ dvijaṃ dṛṣṭvā niṣādena nipātitam /
ṛṣer dharmātmanas tasya kāruṇyaṃ samapadyata //
'But when seeing the male bird slain by the hunter the compassion of the *dharma*-souled Sage was aroused'.

This suggests that Vālmīki becomes offended immediately. Though *kāruṇya* 'compassion' or 'kindness' is derived from *karuṇa*, it is not likely that it is used here as the equivalent of *karuṇa* as a *rasa* since the *bhāva-rasa* concept, even if P.V. Kane's (1961, p. 47) conjecture of 300 AD as the date for the composition of the Nāṭyaśāstra is accepted, could not have had time to influence oral poetry, especially on account of its emphasis on dramaturgy.

1.2.13

tataḥ karuṇa-veditvād adharmo 'yam iti dvijaḥ /
niśāmya rudatīṃ krauñcīm idaṃ vacanam abravīt //

'Then – hearing the crying female Sārus Crane, the Twice-born [thought], because of [his] affinity with sorrow/empathy, this [is] evil, [and] uttered this injunction':

The *dvija* here may be juxtaposed to the *dvija* in the preceding *śloka*. Vālmīki also felt a sense of identification with the dying bird; this would aggravate the sin of the *niṣāda* as it would make him guilty of a symbolic *brahmahatyā* – without doubt the most heinous of all conceivable offences in Hindu India. This *śloka* suggests the general themes in the epic of exile and suffering.

1.2.14

mā niṣāda pratiṣṭhāṃ tvam agamaḥ śāśvatīḥ samāḥ /
yat krauñca-mithunād ekam avadhīḥ kāma-mohitam //
'[You] hunter! Never more shall you come home as you murdered, in a pair of Sārus Cranes, the male [while he was] impassioned by love-making'.

In other words you shall cease to have a home and a wife, for you caused such sorrow to the Cranes, you shall experience similar sorrows yourself. The hunter is at least guilty of three things; 1) he killed the male Sārus Crane; 2) he killed him while he was making love, and that is considered despicable, like murdering a sleeping person; 3) he killed the Crane in front of the sage. Thus the *niṣāda*, like Rāvaṇa, breaks the common bond, the harmony, to cause separation. His act is *pratilomam*, and displays *adharma*, as he kills the Sārus Crane that symbolises the very champion of *dharma*, namely Rāma; but also, as is often the case in Indian literature, because the offence is committed against a couple engaged in making love, cf. e.g. Pāṇḍu (Mahābhārata. 1933, Ādiparvan 1.109.18–30). This activity was apparently conceived of as an apotheosis of congruence and harmony, hence also the frequent instances of couples (*maithuna*) on Hindū temples, e.g. at Koṇārka, to ward off evil influence (apotropaic magic). The irrevocable nature of the separation enhances the grief and makes the forlorn cry of the surviving bird all the more poignant – for it hints at the afflictions which will overcome both Rāma and Sītā later.

But Ānandavardhana and Abhinavagupta write as if it were the female, and not the male Sārus Crane, that was killed by the hunter. They think that this would fit the structure of the plot by foreshadowing that Sītā is carried away by Rāvaṇa (the hunter) and that she in the end vanishes into the earth whereafter Rāma is left alone to mourn; so whereas Vālmīki (or the composer of this *sarga*) tended to stay in tune with the chaos of life the critics wanted a perfect theory to match a perfect plot.

1.2.15

tasyaivaṃ bruvataś cintā babhūva hṛdi vīkṣataḥ /
śokārtenāsya śakuneḥ kim idaṃ vyāhṛtaṃ mayā //
'So saying this [and] looking into [his] heart despondency arose – [and he thought] 'Afflicted with grief – on account of the bird – what is it I have said?''

The force of his spontaneous indignation surprises him. What is it I have done to the hunter? Such a curse was imagined to be very effective, and could not like the gift from a God, be taken back; but more significantly is perhaps the implied question 'What is it I have undertaken to do?' Namely to write the Rāmāyaṇa.

6. The basic cladistic affinity between species

The affinity between himself and the *krauñca* pair which gave Vālmīki the cause for cursing the hunter, and which inspired him to begin (that part of) his story might be regarded as a romantic idiosyncrasy. Such a point of view, however, would have been alien to Indian thought in general, e.g. Ṛgveda 10.146; Āraṇyakakāṇḍa (Vālmīki, 1963), Āraṇyaparvan (Mahābhārata, 1942) and to some European notions as well, cf. f.ex. Robert Burns' 'To a Mouse,' or Diderot's (1987) satirical critique of Descartes in 'Le Rêve de d'Alembert'[7] or William Blake's perceptive insights in 'The Fly' which strike some of the same notes as are present in Chuang Tzu's butterfly dream, and in the haikus of Basho. And with usual perspicacity Darwin (1998, Chapter IV and V especially) delineated the affective similarities in the emotional spectrum of human and non-human animals.

Affective states are fundamental (Panksepp, 1998a, 1998b, 2003; Watt, 1998, 1999; Cabanac 1999). They determine behaviour and motivations. To some extent they are amenable to cognitive influence (Panksepp, 1998a, 1998b; Watt, 1998, 1999), but cognition is not able to generate affective states; this was clearly seen by David Hume who remarked that the intellect only functioned to serve and further the affections (Hume, 1739/1896).

The ability to feel, to know what it is like to be a specific individual (Nagel, 1974), i.e. the state of affective consciousness, originates in basic brain structures such as the periaqueductal grey, the colliculi, the amygdala and the hypothalamus but it reverberates throughout the entire brain (Panksepp, 1998a, 1998b; Watt, 1999). The basic emotional systems of animals have primarily evolved because such functions enhanced the efficiency of the organism's interacting with the environment; the ability to escape was increased by fear, to attack by rage, to seek social interaction and nurturance by distress and to reproduce by desire (Panksepp, 1998b). Human and animal affective consciousness is based on sensory perceptions, motor-processes (Sheets-Johnstone, 1999) and skin-boundary awareness (Sheets-Johnstone, 1998; Panksepp, 1998a: 2003; 1998b) which together form body image sensations (representations) and hence the nucleus of self-consciousness and the realisation of distinctness in relation to the environment. The crucial role of affective states and their interdependence in determining motives, intentions and levels of lived intensity formed some of the most fundamental concepts of Indian theories of art in the form of *rasa* as developed in the Nāṭyaśāstra (1988), the Abhinavabhāratī (1988) and the Dhvanyāloka (Ānandavardhana and Abhinavagupta 1940).

7. Fundamental emotional states, *sthāyibhāva*, and aesthetic experience, *rasa*

Eight basic emotional states have so far been correlated with neuroanatomical circuits and/or neurotransmitter substances;[8]

[7]For example page 104: 'Cet animal se meut, s'agite, crie; j'entends ses cris à travers la coque; il se couvre de duvet; il voit; la pesanteur de sa tête, qui oscille, porte sans cesse son bec contre la paroi intérieure de sa prison, la voilà brisée; il en sort, il marche, il vole, il s'irrite, il fuit, il approche, il se plaint, il souffre, il aime, il désire, il jouit, il a toutes vos affections, toutes vos actions il les fait. Prétendrez-vous avec Descartes que c'est une pure machine imitative? mais les petits enfants se moqueront de vous, et les philosophes vous répliqueront que si c'est là une machine, vous en êtes une autre'.

[8]This does not, however, in any way illucidate the much more fundamental question of how and why (some) electrochemical processes are related to conscious experience. This so-called 'binding problem' is today, despite a

1) seeking/exploration, 2) rage/anger, 3) disgust, 4) angst, 5) sexuality/lust, 6) nurturance/care, 7) grief/separation distress/social bonding, 8) play/joy/social affection (Watt 1999; Panksepp 1998b). They correspond to the *sthāyibhāva* (Nāṭyaśāstra 1988, VI.15–17) of

1) *utsāha*, 2) *krodha*, 3) *jugupsā*, 4) *bhaya*, 5) *rati*, 6) *sneha*, 7) *śoka* and 8) *hāsa*. The *sthāyibhāva* of 'marvel/awe' *vismaya* and 'peace' *śama* or *nirveda* do not seem yet to have been traced neuroanatomically. But Paul Ekman (1992) assumes that the affective state of surprise/wonder/awe is fundamental and has as such separate neuroanatomical correlates.

In the absence of self-centredness and 'self-interest' or 'egoism,' *ahaṃkāra*, in a state of 'disinterestedness' *tāṭasthya*, and of genuine sympathy, the *sthāyibhāvas* are modulated to become 'aesthetic experience' *rasa*; i.e.

1) *vīra* 'heroism,' 2) *raudra* 'fury,' 3) *bībhatsa* 'disgust,' 4) *bhāyanaka* 'fear,' 5) *śṛṅgāra* 'love,' 6) *preyas* 'loving kindness' (Rudraṭa 1886: XII.3), 7) *karuṇa* 'sorrow,' and 8) *hāsya* 'mirth'. The corresponding *rasa* of *vismaya* is *adbhuta* 'wonder/ferlie'. But 'aesthetic experience' should perhaps be understood simply as the emotional experience purified of self-interest (and primordial angst) regardless of explicit aesthetic connotations.

'Sorrow' *karuṇa*, is thus an emotional state, an ability to recognise the emotional state in another living being because of having prior experience of a similar emotional state, as here, in the form of *śoka* though in the absence of *ahaṃkāra* experienced as *karuṇa*; but the prior analogous experience is a prerequisite. When William Blake wrote in 'A Little Boy lost':

> "Nor is it possible to Thought
> A greater than itself to know,"

he also indicated that it is impossible to imagine anything by using deduction and fantasy. Nothing is subjectively real before it has been experienced; for we cannot transcend the limits of our own experiences; and the deepest experience we have had determines the limits of our emotional and conceptual world; and the more basic[9] an emotion is the more identical to similar experiences in other individuals it seems to become both intraspecifically and interspecifically – so irrespective of the considerable differences between species and especially between birds and mammals a sketch of some of the comparable functions of the avian and mammalian sexually active neurotransmitter substances, which to a considerable extent would have determined the behaviour of the female Sārus Crane, might suggest the common basis for empathy and hence the authenticity of Vālmīki's reaction; furthermore, the grief of the surviving crane would have been very conspicuous as the cognitive abilities of some avian species[10] apparently may even exceed those of Primates and Cetaceans (Catchpole, 1994).

plethora of attempts to explain it (or explain it away), as puzzling as ever and presents the greatest possible challenge to theoretical concepts and experimental ingenuity.

[9]The less it is determined by ontology and the more it simply is the 'phylogenetic' experience in itself – though there will nearly always remain some personal traces or *vāsanā*s.

[10]An African Grey Parrot is alleged to have learnt a vocabulary of 950 words – and to be able to use them appropriately.

8. Comparison between the function of sexual neurotransmitter systems in cranes and Mammals

There are also sound physiological reasons for empathy, not only with conspecifics but also with other species. Vertebrates show distinct homology in the structure of the brain; and the central nervous system operates on identical principles across clades. Thus the information transfer within a single neurone is electrical but at the synapses between the neurones it is conducted chemically by a wide variety of specific transmitter substances, viz. amino acids (such as glutamate), biogenic amines (such as serotonin), neuropeptides (such as oxytocin), and various other substances (such as acetylcholine and nitric oxide). There is no neurotransmitter that is specific for humans, i.e. which is not also present in other species.

There is a distinct relationship between avian and mammalian sexual neurotransmitter systems. Nine amino acids form the avian posterior pituitary sexual neuropeptide 'arginine vasotocin'. When its arginine is slightly modified to form another amino acid 'leucine', then arginine vasotocin becomes the mammalian female sexual neuropeptide 'oxytocin'. On the other hand when the isoleucine in arginine vasotocin is modified to another amino acid, 'phenylalanine', then arginine vasotocin becomes the mammalian male sexual neuropeptide 'arginine vasopressin' (Panksepp 1998a: 231). The following comparisons may give a more specific impression of the similarities between gruiform and mammalian neurotransmitter systems.

LH-RH (luteinizing hormone-releasing hormone) increases in cranes the amount of gonadal steroids and determines seasonal reproduction and accessory reproductive development (Gee and Russman, 1996); and in mammals it controls secretion of gonadotrophins from the pituitary, preparation of sexual hormones, female sexual arousal and receptivity (Panksepp, 1998a: 243, 102). TRH (thyrotrophin-releasing hormone) controls the growth hormone and prolactin plus metabolic rates and promotes or inhibits reproductive development in cranes (Gee and Russman,1996); and in mammals it causes metabolic arousal, arousal generally and playfulness (Panksepp 1998a: pp. 101–102). Estrogens influence in cranes oviduct growth, maturation, deposition of body fat, the formation of secondary sexual characteristics, sexual behaviour and ova developmental cycling (Gee and Russman, 1996); and in mammals it causes female sexual receptivity, lordosis and production of sexual pheromones (Panksepp, 1998a: 240). Prolactin level in cranes induces broodiness and egg production (Gee and Russman, 1996); in mammals it stimulates maternal motivation and social feelings and diminishes separation distress calls (Panksepp, 1998a: pp. 101, 268). ACTH (adrenocorticotrophic hormone) produces in cranes elevated corticosterones in response to stress, influences ovulation and stunts growth (Gee and Russman, 1996); in mammals it determines levels of stress and attention, and seems to be able to generate flight and freezing attitudes (Panksepp, 1998a: pp. 101, 218).

This correspondence in structure and function of affective systems follow the general pattern of evolutionary similarity (Panksepp, 1998a: pp. 230–231). Arginine vasopressin, oxytocin and opioid systems appear to be fundamental in the formation of social bonds in mammals just as the homologous peptide, arginine vasotocin, appear to be in birds (Panksepp 1998a: 256; and cf. Panksepp *et al.*, 1997). Arginine vasotocin and various other neurotransmitters are probably stimulated by pair bonding in cranes and especially

by courtship behaviour. In the absence of such stimulation, as for example when one of a pair dies, the resulting neurotransmitter deficiency would generate separation distress calls such as those Vālmīki heard. Both oxytocin and vasotocin are effective inhibitors of distress calls in various species and this indicates that social well-being is caused by the same neurotransmitters that cause sexual stimulation and nurturance (Panksepp, 1998a: 256). The sudden neurotransmitter depletion in the female Sārus Crane would thus cause arousal of separation distress calls which both in con-specifics and in mammals could trigger a rapid decline in similar neurotransmitter systems, and thus in turn produce a sense of 'social loss', *śoka*, and subsequently maybe a feeling of empathy and 'sorrow,' a state of *karuṇarasa*.

9. Basic *tanmayībhāva*, identity, and *sneha*, affection

Kālidāsa's description of Śakuntalā's affection for or perhaps rather consubstantiality with Nature in the form of plants and animals,[11] bespeaks an attitude of intuitive or spontaneous empathy that as a pronounced *vāsanā*, would have had to be innate, cf. Yogasūtra IV.8 (Patañjali, 1961). Her sense of *tanmayībhāva* should perhaps be regarded as an intensified kind of *sneha* or as a *preyas* even. This is evident when Śakuntalā in I.17 says (Kālidāsa, 1969):

asti me sodara-sneho ʾpyeteṣu
"I have an innate affinity for them [i.e. the trees]"
and in IV.13:
Śakuntalā: *tāta – latā-bhaginīṃ vanajyotsnāṃ tāvad āmantrayiṣye.*
Kāśyapa: *avaimi te tasyāṃ sodaryā-sneham.*
Śakuntalā (*upetya latām āliṅgya*): *Vanajyotsne cūta-saṃgatāpi māṃ pratyāliṅgeto gatābhiḥ śākhābāhābhiḥ. adya prabhṛti dūra-parivartinī te khalu bhaviṣyāmi.*
Śakuntalā: "Father! So I shall have to say farewell to Vanajyotsnā – [my] liana sister".
Kāśyapa: "I do know of your innate affection for her".
Śakuntalā: (Going over [and] embracing the liana) "Vanajyotsnā – though joined with the Mango Tree you must embrace me here on the opposite side with [your] tendril arms. But from now on I shall indeed be living far away from you".

Here the diagnostic term is *sodaryāsneha*. Likewise Bhāsa (1996), Pratimānāṭaka V.11, lets Rāma tell Maithilī/Sītā:

"Say farewell to the deers and the trees [that have been] adopted as children, to the Vindhya Forest, and to your beloved friends, the lianas".
āpṛccha putra-kṛtakān hariṇān drumāṃś ca vindhyaṃ vanaṃ tava sakhīr dayitā latāś ca //

Without an innate affinity based on direct experience there is no correspondence or rather no recognition. This experience is necessary both regarding spontaneous 'care' *sneha* (Rudraṭa 1886: XIII.3), or 'pity/sorrow *śoka*, and their resultants, *preyas* and *karuṇa*. Goethe had to have the understanding of a *sahṛdaya* in order to appreciate (or to see his own world and himself in) the Abhijñānaśākuntala to the extent he actually did; and Vālmīki took for granted that

[11] Comparable states of identification with plants and animals occur in many different contexts; see for example (Shanon, 2002: pp. 74 and 84).

his listeners could recognise the outrage of killing a Sārus Crane because they were familiar with the behaviour of cranes and could distinguish them from various other species. The basic assumption here is that a harmonic state of affinity with Nature was as vivid to the listeners of the Rāmāyaṇa as it was to Śakuntalā and Sītā. With knowledge of the ethology of Sārus or Eurasian Cranes it becomes possible to share Vālmīki's anger and sorrow.

10. Degrees of grief, *śoka* and sorrow, *karuṇa*

Beside the general affinity spontaneously felt with all living beings and the sympathy that arises when seeing any creature in distress there are (at least) two other and probably closely related sources or kinds of empathy. The first is the state of affinity where some of the neurones that are activated in the afflicted object, by cognitive and affective recognition, activate the corresponding audio-visual 'mirror' neurones in the subject (cf. Gallese, 1999; Kohler et al., 2002); the second is the alleged affinity caused by yogic *sākṣāt*. The Yogasūtra III.18 states (Patañjali, 1961): *Saṃskāra-sākṣāt-karaṇāt pūrva-jāti-jñānam* "Because of immediate intuition of [prior] perception [there is] knowledge of a previous birth"; and Yogasūtra III.19 *Pratyayasya paracitta-jñānam* "[Because of immediate intuition of prior perception there is] knowledge of another's mind through an image-concept (*pratyaya*)"; and Yogasūtra III.17 *Śabdārtha-pratyayānām itaretarādhyāsāt saṃkaras tat-pravibhāga-saṃyamāt sarva-bhūta-ruta-jñānam* "Because of reciprocal superimposition [there is] fusion of the image-concept, the intentionality and the vocalisation – but by *saṃyama* (= *dhāraṇā*, *dhyāna*, *samādhi*, Yogasūtra III.4) distinction [between] them [results in] knowledge of the calls of all creatures".

Vālmīki's reaction here is perhaps rather that of a *yogī* than that of a *sahṛdaya* as he is witnessing a real event and not a scene on the stage. But Abhinavagupta writes (Naṭyaśāstra 1988, [1] VI.32, Abhinavabhāratī: 288, line 9–12) about the *sahṛdaya*s:

> *sva-para-viveka-śūnyāsvāda-camatkāra-paravaśatayā laukikāt pratyayād upārjanādi-vighna-bahulād yogi-pratyayāc ca viṣayāsvāda-śūnyatā-paruṣād vilakṣaṇākāra-sukha-duḥkhādi-vicitra-vāsanānuvedhopanata-hṛdyatātiśaya-saṃvic-carvaṇātmanā bhuñjate*
> "They experience joy in [their] mind[s] through [aesthetic] savouring (*carvaṇā*) of consciousness – rich in delight [and] ready to blend with the various latent impressions (*vāsanā*) in the form of [prior] perceptions of pleasure and pain etc. – [and they do this] by accepting the wonder of [aesthetic] relishing (*āsvāda*) [that is] without [any] distinction [between one's own] self [and] another['s] – [both] because [it is] differing from worldly image-concepts filled with obstacles of gain and loss (*ādi*), but also because [it is] differing from a *yogī*'s image-concepts [which] are harsh with the futility (*śūnyatā*) of the pleasure of sense-objects".

So it seems that for the true *sahṛdaya* all the world might indeed be a stage; yet at the time of the composition of the Bālakāṇḍa the concept of *rasa* (100 BC to 300 AD) was only beginning to take form so Vālmīki's attitude might, pace Abhinavagupta, have been more yogic and harsh than aesthetic; and Ānandavardhana probably regarded a *rasa* as an intensified or fully developed state of a *sthāyibhāva* (Ānandavardhana 1940: 390, Dhvanyāloka 3.26; Ānandavardhana and Abhinavagupta, 1990: 16–19). However, the paramount question here is the possible difference between *āsvāda* and the *pratyaya*, the 'awareness' or the 'image-concepts' of a *yogī* during such an event. Both states imply transcendence of the *sukha-duḥkha*

dichotomy and of *ahaṃkāra*, i.e. indicate a state of detachment without primal angst; but I cannot see how Abhinavagupta might have envisaged the difference – so faute de mieux it could be explained either by difference of character or perhaps by reactions at different yogic stages or even by reactions to different stimuli. However, Abhinavagupta seems to emphasise that the *sahṛdaya* has deep empathy whereas a *yogī* only has little as he is too austere (detached?) to care and hence has no patience with the diversified colours of the emotions. For according to the law of *karma*, or ultimate responsibility, *karuṇa* might be considered to be rather superfluous. We are all totally responsible for whatever happens to us.

However, Vālmīki shares both Śakuntalā's and Sītā's consubstantiality with Nature and is strongly affected by the killing of the male Sārus Crane, for he can feel and recognise in himself – not what it is like to be a bat (Nagel, 1974) – but what it is like to be a female Sārus Crane who has lost her mate by a wanton act of cruelty. A similar sense of sorrow and indignation inspired Shakespeare to write 'The Phoenix and the Turtle' in commemoration of Ann and Roger Line (Finnis and Martin, 2003); and this indicates that birds tend to symbolise pair relationships better than other animals. But there appears to be a discrepancy between the indifference, the *tāṭasthya*, of the yogic attitude that all is well with the world whatever happens and the sense of *karuṇa*, 'sorrow' on account of the aesthetic sense of understanding what it is like; but there is probably also a discrepancy between the *tāṭasthya* and the spontaneous sense of indignation. I assume that there might be three layers present here. The original core reaction is the spontaneous indignation; the second is the yogic capacity of the sage to stay aloof and the third is the presumably added explanation that Vālmīki is experiencing the *rasa* of *karuṇa* in the way Abhinavagupta thought. But it is the spontaneous sense of grief, because of a feeling of identity, *tanmayībhāva*, that, as the cause of artistic inspiration, is emphasised by Ānandavardhana (1940: 84–85) in the Dhvanyāloka 1.5:

kāvyasyātmā sa evārthas tathā cādikaveḥ purā /
krauñca-dvandva-viyogotthaḥ śokaḥ ślokatvam āgataḥ //

"This meaning [i.e. *rasa*] is really the soul of poetry – and so, long ago, the grief of the arch-poet, because of the separation of a pair of Sārus Cranes, was transformed into versification".

That Ānandavardhana writes *śoka* and not *karuṇa* suggests that he imagined that the original or first impulse was *laukika*; so he seems to have found – like Wordsworth – that it is during the composition afterwards that *śoka* is transformed to *rasa*; but Abhinavagupta (Ānandavardhana, 1940: pp. 85–86) explains in the Locana to the Dhvanyāloka 1.5 that the sense of *karuṇa* followed immediately after the sense of *śoka*:

śoka *iti krauñcasya dvandva-viyogena sahacarī-hananodbhūtena sāhacarya-dhvaṃsanenotthito yaḥ śokaḥ sthāyibhāvo nirapekṣa-bhāvatvād vipralambha-śṛṅgārocita-rati-sthāyibhāvād anya eva, sa eva tathābhūta-vibhāva-tad-utthākrandādy-anubhāva-carvaṇayā hṛdaya-samvāda-tanmayībhavana-kramād āsvādyamānatāṃ pratipannaḥ; karuṇa-rasa-rūpatāṃ laukika-śoka-vyatiriktāṃ sva-citta-druti-samāsvādhya-sārāṃ pratipanno, rasa-paripūrṇa-kumbhoccalana-vac citta-vṛtti-niḥṣyanda-svabhāva-vāg-vilāpādi-vac ca samayānapekṣatve 'pi citta-vṛtti-vyañjaka-tvād iti nayenākṛtakatayai-vāveśa-vaśāt samucita-śabda-cchando-vṛttādi-niyantrita-śloka-rūpatāṃ prāptaḥ.*

"'***Grief***': The grief – which by the separation of the pair of Sārus Cranes burst forth on account of the dissolution of the intimate bond (*sāhacarya*) because of the killing of the mate (*sahacarī*) [12] – [was] a basic emotion (*sthāyibhāva*) differing indeed (*anya eva*) from the basic emotion of desire as [in] (*ucita*) love-in-separation (*vipralambha-śṛṅgāra*) because of the affective state (*bhāvatvāt*) of hopelessness (*nirapekṣa*) – so this [grief] – generated by the sensation (*carvaṇayā*) of the existing *vibhāva*s such as (*ādi*) the mournful cry (*ākranda*) produced by the situation (*tad*) [in the form of an] *anubhāva* – definitely released (*pratipannaḥ*) a state of aesthetic relishing (*āsvādyamānatām*) on account of the transformation (*kramāt*) through the identification (*tanmayībhavana*) [and] the similarity (*samvāda*) of heart; [and this grief] took (*pratipannaḥ*) the form of the *rasa* of sorrow (*karuṇa*) [because] depending on (*sārām*) the aesthetic experience (*samāsvādhya*) of an innate [*sva*] melting awareness – [but also because] differing from worldly (*laukika*) grief; [so this grief] acquired (*prāptaḥ*) a verse-form determined by appropriate words, metre, prosody etc. because of the power of self-absorption (*āveśa*) directly (*eva*) through spontaneity (*akṛtakatayā*) [and] through wisdom (*nayena*) – for [it was] like a cry of sorrow [or] something similar [when] a mental state [is] overflowing with innate affection – and comparable to the flowing over of a jar full of water – precisely (*api*) so on account of the suggestion (*yañjakatvād*) of a mental state beyond the need (*anapekṣatve*) of semantemes (*samaya*)".

A state of *tāṭasthya* beyond *ahaṃkāra* is presumably innate when once acquired – so any experience would take place on an *alaukika* level in the form of a *rasa*; but according to Ānandavardhana and Abhinavagupta this is not the case. *Śoka* is the immediate reaction which after a shorter or longer interval is transformed into *rasa*. However Ānandavardhana perceived the Rāmāyaṇa to be pervaded by the *rasa* of *karuṇa*;[13] Dhvanyāloka 4.5 (Ānandavardhana 1940: 529–530):

rāmāyaṇe hi karuṇo rasaḥ svayam ādi-kavināsūtritaḥ śokaḥ ślokatvam āgataḥ ity evaṃ vādinā. nirvyūḍhaś ca sa eva sītātyanta-viyoga-paryantam eva svaprabandham uparacayatā.
"But in the Rāmāyaṇa the *rasa* [of] *karuṇa* is inspired (*āsūtritaḥ*) by the arch-poet himself when he said 'grief has become versification'; and this [*rasa* is] indeed completed by the attunement of his composition – even to the point of the final separation of Sītā [from Rāma – to it]".

Here the grief (*śoka*) is *laukika* 'worldly', but the versification (*rasa*) *alaukika* 'transcendental'; so the poem is inspired by grief to become aesthetic appreciation of sorrow;[14] and the *krauñcavadha* episode fulfills thus a cataphoric function in suggesting the general theme of the epic, and perhaps also hinting at the Buddhist notion of the fundamental *duḥkha* of human existence, for this rather late episode added to the shift of focus from a tale of adventure to a more religiously edifying fable.

Yet as Abhinavagupta explains there is a crucial difference between 'worldly', *laukika śoka* and 'unworldly,' *alaukika karuṇa* because the latter is grief detached from personal involvement, it is grief per se, without the burden of the personality (cf. Eliot, 1951), i.e.

[12] *Sahacarī* and not *sahacara*; Abhinavagupta pretends that it is the female Sārus Crane that is killed and not the male.

[13] However, Raghavan (1975: 51) notes that both Kṣemendra and Kuntaka find that *śānta* also is the *rasa* of the Rāmāyaṇa.

[14] The *rasa*s of Bhavabhūti's (1934) Uttararāmacarita are *karuṇa* and *adbhuta* as the *sūtradhāra* says in the beginning of Act VII. Rāma, as an incarnation of Viṣṇu, is naturally associated with *karuṇa* and empathy.

without *ahaṃkāra* or egocentricity or 'ignorance/inexperience', *avidyā*, or indeed without ontological fear.[15] Such a notion of transcendence is perhaps also implicit in Aristoteles' Poetics (1982) XIV.2:

> 'It is necessary to construct the plot in such a way that anyone hearing about – but without having to see – how the events are unfolding – both has to thrill/chill and to feel pity on account of the concomitants',
> *δεῖ γὰρ καὶ ἄνευ τοῦ ὁρᾶν οὕτω συνεστάναι τὸν μῦθον ὥστε τὸν ἀκούοντα τὰ πράγματα γινόμενα καὶ φρίττειν καὶ ἐλεεῖν ἐκ τῶν συμβαινόντων.*

This seems to mean that both emotions would have to exist simultaneously; however, these two moods or brain states are hardly compatible on a *laukika* level, but have – in order to co-exist synchronically – each to be modified to an 'aesthetic experience,' a *rasa*. In order to enjoy sorrowful or terrible incidents an *alaukika* state, a proper aseity, would first have to be achieved – and to thrill and chill simultaneously with feelings of pity would seem to indicate a reaction comparable to that of *karuṇa*.

10.1 Sorrow and separation distress calls

Sad and sorrowful music or tales can elicit a variety of responses, such as 'shivers' *vepathu*, up along the spine, and 'weeping,' *aśru*, both *sāttvikabhāva*s, 'involuntary signs of emotion'; (Nāṭyaśāstra 1988, VI.22) and a feeling of chills or thrills – a more complex response in which the inherent sadness is tinged by joy. The frequency of chills/thrills is reduced if a rapid decline in endogenous opioids is blocked; so this experience seems basically to be connected with a sense of social loss (Panksepp, 1998a: pp. 278–279) as communion stimulates release of endogenous opioids such as β-endorphin; however, a periconscious sense of the temporal nature of the experience – maybe an inkling of hope – would help to keep the bitter-sweet sensation from turning sour.

But if sad and sorrowful music or tales, which nevertheless afford pleasure under certain circumstances, trigger separation distress calls because of resembling or suggesting them, and induce more chills/thrills than coherently pleasant tales or merry music then it seems that feelings associated with social deprivation may be more pronounced in humans than feelings associated with well-being or homoeostasis (Panksepp, 1998a: p. 278) – at least on this level of awareness. Thrills/chills exhibit apparently contradictory aspects in being both sad and yet exciting, but this does not necessarily imply any category similarity with a *rasa* in which a state of depersonalised affective response is savoured.

Themes dealing with lost love and longing are among the most effective stimuli for human emotional states and furnish the basic stuff of which dreams and dramas are made. Separation distress can follow two different patterns. If the wistful awareness of loss is tinged by the possibility of renunion, it is 'love-in-separation', *vipralambhaśṛṅgāra*[16] and a 'condition with hope,' *sāpekṣabhāva* (Nāṭyaśāstra 1988: 306, VI [45–46]), as in the Meghadūta; but the *rasa*

[15] For a discussion of the possible neurochemical changes that underpins this psychodynamical process, see James Austin's (1998) 'Zen and the Brain'.

[16] Cf. Nāṭyaśāstra 1988: 301, VI.45–46: *tasya dve adhiṣṭhāne sambhogo vipralambhaś ca* 'Its [= *śṛṅgāra*'s] two states [are love-in] enjoyment [and love-in] separation'.

of *karuṇa* is rather suggestive of a 'condition without hope', *nirapekṣabhāva*;[17] for the loss is here irremediable, as eventually it becomes in the Rāmāyaṇa. But *karuṇa* or 'sorrow,' which indicates a state of *tanmayībhāva*, the sense of (unconditional) relatedness to others and to Nature, is present in both conditions though only in the latter does the sorrow become permanent. Irrevocable circumstances, as in *nirapekṣabhāva*, may generate the most profound affective responses, because this state is beyond the influence of voluntary parametres, i.e., it is not amenable to change. The condition is absolute, and the reaction would become a *sāttvikabhāva*, such as 'horripilation/piloerection', *romapulaka*, a spontaneous manifestation of emotion. Affective reactions that are subject to modification by voluntary decisions may be less complete or profound than responses on which conscious decisions in the form of volition has no influence.[18]

Whereas tragedy was prevalent in Athenian and Elizabethan drama, e.g. Hippolytos, Mēdeia, the Oresteia, and Romeo and Juliet, Antony and Cleopatra, it is absent from classical Indian drama, such as Mālatīmādhava, Abhijñānaśākuntala and Vikramorvaśī. However, in both the Indian epics there is a sense of irredeemable tragedy. Conversely both the Greek epics have comparatively happy endings though the happiness is heavily modified in the case of the Iliad; but contrariwise the basic *rasa* of the Mahābhārata is *śānta*, 'peace' – peace after all the turmoil and the bloodshed, and in the Rāmāyaṇa 'sorrow,' *karuṇa*, at least according to Ānandavardhana (1940: 529–533, 4.5). But while the ending of the Yuddhakāṇḍa conforms to the general Indian pattern of happy endings, the ending of the Uttarakāṇḍa becomes a tragedy as Rāma causes Sītā to be taken away by the Earth because of his doubts. In fact the *rasa* of *vīra*, the 'heroic' *rasa*, is really epitomised by Sītā – rather than by Rāma who continues to harbour suspicions against her (also a reflection of the brāhmaṇical misogynistic influence).

11. Semantemes contra pitch and timbre

The choice of a pair of non-human animals demonstrates the universality of grief. Had it been a pair of humans universality would have only just been plausible, but by taking a pair of birds *śoka* becomes a force that pervades the whole of Nature and acquires a phylogenetic foundation. This is congruent with the Buddhist and Jain influence regarding *ahiṃsā* (the wife of *Dharma*), but it was probably also influenced by the world view of the Proto-Indo European speaking tribes who distinguished between animate and inanimate entities (Gamkrelidze and Ivanov, 1995: 387–411). Cranes are indeed very well suited to exemplify this universal grief. So for the 'ground tone' or the 'standing wave', of the Rāmāyaṇa in its present composite form, it would be difficult to find a more fitting icon than a pair of Sārus Cranes – for as cranes belong to a different phylum the general and all pervading notion of *śoka*, which underlies not only the Rāmāyaṇa, but the life of all living beings, become more

[17] According to Bhoja (Raghavan 1963: 60–64) *karuṇavipralambha* may develop from love in which there is a hope of reunion while *karuṇa* as such, which may develop from any emotion, is destitute of hope.

[18] The scope of free will is steadily diminished by new research – see Libet et al. (1999), even to such an extent that it might perhaps soon seem questionable to assume that free will as such even is theoretically possible; however the fluid situation concerning the subjective/qualia-determining rôle of quantum processes in brain states might still keep the possibility open, cf. Hodgson (2002); and reality as such is probably neither wholly deterministic nor wholly indeterministic but a state defying a complete analysis and description.

unmistakable – as the autochthonic-brāhmaṇical influence gradually changed the Vedic and *kṣatriya*-oriented nature of the epic.

The *sādhāraṇatva* or 'universality' (Nāṭyaśāstra VI.83: 335 Abhinavabhāratī line 25) is enhanced because it is not the semantic content of a sentence, its *tātparya* or 'purport', but the basic timbre, pitch and intonation in the voice, [19] that is the quality of the *anubhāva*, that carry the real affective content, and which reveals the authenticity of the *sthāyibhāva*. And indeed the intonation, the pitch and the timbre are to a greater extent able to engender an emotional impact, such as a thrill/chill (a *sāttvikabhāva*) than any conglomerate of 'semantemes', *samaya*, which merely modify the basic tonal quality with concepts.[20] So when Abhinavagupta writes *samaya* it indicates the *sādhāraṇatva* of the grief. It is the timbre, the pitch and the tone of the cry that carry the impact, for its force is so basic and primordial that it reaches greater depths than both denotations and connotations can convey.[21] The intonation of the voice has a greater capacity to convey a feeling of reality than the signifiers can hope to do; and though the sexuality or love of animals usually is supposed to consist of a mere 'semblance of *rasa*,' i.e. *rasābhāsa*, Vidyādhara maintains in the Ekāvalī that animals also may experience sexuality or love in the form of a *rasa* though this would necessitate that animals had the ability to transcend the *ahaṃkāra* state; but perhaps the notion of *ahaṃkāra* simply is far more pronounced in humans than in other animals. Vidyādhara (1903: 106, Unmeṣa III) writes:

> *Apare tu rasābhāsaṃ tiryakṣu pracakṣate tan na parīkṣākṣamam / teṣv api vibhāvādi-saṃbhavāt / vibhāvādi-jñāna-śūnyās tiryañco na bhājanaṃ bhavitum arhanti rasasyeti cen na / manuṣyeṣv api keṣu cit tathābhūteṣu rasa-viṣaya-bhāvābhāva-prasaṅgāt / vibhāvādi-saṃbhavo hi rasaṃ prati prayojako na vibhāvādi-jñānam / tataś ca tiraścām apy asty eva rasaḥ /*
>
> "But otherwise this does not indicate a valid conjecture for a mere appearance of *rasa* in animals. [For] even in them the *vibhāva* etc. arise spontaneously. [The *pūrvapakṣī*:] 'Lacking knowledge of the *vibhāva* etc. animals are not capable of being a fit vehicle for *rasa*'. But this [is] not [so]; even consciousness in humans as in whatever is alive (*ābhūteṣu*) [exists] in relation to the *rasa* state of being and non-being. For the [mere] presence of the *vibhāva* etc. [is] indeed leading to *rasa* – [and] not the knowledge of the *vibhāva* etc. – so there is even *rasa* in animals".

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References

Abhinavabhāratī (1988). See *Nāṭyaśāstra*.

Abhinavagupta (1940). See Ānandavardhana.

Ali, Sálim and S. Dillon Ripley (1983). *Handbook of the Birds of India and Pakistan*. Together with those of Bangladesh, Nepal, Bhutan and Sri Lanka. Compact Edition. Delhi. Oxford University Press.

[19] A *sāman* termed *vāñnidhanakrauñca* 'a Eurasian/Sārus Crane [call] concluding in speech' (Staal, 1985) might suggest the notion that the quality of the sound can be so acute that it forms semantic associations.

[20] However, the avian HVc area seems to correspond to Broca's area in Humans (Catchpole, 1994).

[21] Wernike's area in the left temporal cortex is activated when processing the words and the purport (*tātparya*) of a sentence, but the emotional system of the periaqueductal gray, the hippocampus, the hypothalamus, the septum and the amygdala process the feeling tone or the quality of the sound and is as such more fundamental (Panksepp, 1998a).

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Ānandavardhana (1940). *Dhvanyāloka*, with the *Locana* and *Bālapriyā Commentaries* of Abhinavagupta and Rāmaśāraka. With the Divyāñjana Notes by Mahādeva Śāstri. Edited by Paṭṭābhirāma Śāstri. The Kashi Sanskrit Series 135. Alaṅkāra Section No. 5. Benares City. Chowkhambā Sanskrit Series Office.

Ānandavardhana and Abhinavagupta (1990). *The Dhvanyāloka of Ānandavardhana with the Locana of Abhinavagupta*. Translated by Daniel H. H. Ingalls, Jeffrey Moussaieff Masson and M. V. Patwardhan. Harvard Oriental Series. Vol. 49. Cambridge. Massachusetts. Harvard University Press.

Aristotle (1982). *The Poetics.* Longinus *On the Sublime*. With an English Translation by W. Hamilton Fyfe. Demetrius *On Style*. With an English Translation by W. Rhys Roberts. Loeb Classical Library. Cambridge. Massachusetts. Harvard University Press.

Austin, James H. (1998). *Zen and the Brain*. Toward an Understanding of Meditation and Consciousness. Cambridge. Massachusetts. Massachusetts Institute of Technology.

Bhāsa (1996). *Pratimā Abhiṣeka. Complete Plays of Bhāsa*. Vol. II. Text with English Translation and Notes by K.P.A. Menon. Delhi Nag Publishers.

Bhavabhūti (1928/1983). *Mālatīmādhava*. With the Commentary of Jagaddhara. Edited with an English Translation, Notes and Introduction by M.R. Kāle. Delhi. Motilal Banarsidass.

Bhavabhūti (1934/1982) (Fourth edition). *Uttararāmacharita*. With the Commentary of Vīrarāghava, Introduction, English Translation and Notes by M.R. Kale. Delhi. Motilal Banarsidass.

Borad, C. K., Aeshita Mukherjee, S. B. Patel and B. M. Parasharya (2002). Breeding performance of Indian Sarus Crane *Grus antigone antigone* in the paddy crop agroecosystem. *Biodiversity and Conservation*. 11, pp. 795–805.

Brockington, John (1998). *The Sanskrit Epics*. Handbuch der Orientalistik. Indien. Zwölfter Band. Leiden. Brill.

Bryson, Reid A., and A. M. Swain (1981). Holocene Variations of Monsoon Rainfall in Rajasthan. *Quaternary Research*. 16, pp. 135–145.

Cabanac, M. (1999). Emotion and Phylogeny. *Journal of Consciousness Studies* 6 (June/july) pp. 176–190.

Catchpole, C. K. (1994). Bird Song. In *The Encyclopedia of Language and Linguistics*. R. E. Asher (Editor-in-Chief). Vol. 1, pp. 360–366. Oxford. Pergamon Press.

Cramp, Stanley (Chief Editor), K. E. L. Simmons, I. J. Ferguson-Lees, Robert Gillmor, P. A. D. Hollom, Robert Hudson, E. M. Nicholson, M. A. Ogilvie, P. J. S. Olney, K. H. Voous, Jan Wattel (1977). Handbook of the *Birds of Europe, the Middle East and North Africa*. The Birds of the Western Palearctic. I. *Ostrich to Ducks.* Oxford. Oxford University Press.

Darwin, Charles (1998). *The Expression of the Emotions in Man and Animals*. With an Introduction, Afterword and Com-mentaries by Paul Ekman. London. HarperCollins.

Diderot, Denis (1987). *Le Rêve de d'Alembert*. Idées IV. Édition critique et annotée présentée par Jean Varloot, Michel Delon, Georges Dulac, Jean Mayer. œuvres complètes. Tome XVII. Paris. Hermann.

Ekman, P. (1992). An Argument for Basic Emotions. *Cognition and Emotion* 6(3/4), pp. 169–200.

Eliot, T. S. (1951). Tradition and the Individual Talent. *Selected Essays* pp. 13–22. Third Edition. London. Faber and Faber.

Ellis, David H., Scott R. Swengel, George W. Archibald and Cameron B. Kepler (1998). A sociogram for the cranes of the world. *Behavioural Processes*. 43, pp. 125–151.

Finnis, John and Patrick Martin (2003). Another turn for the Turtle. *The Times Literary Supplement*. April 18, pp. 12–14.

Gāhākosa of Hāla (Sātavāhana) (1980/1988). Edited and translated with Glossary and Notes by M.V. Patwardhan. Part I with Bhuvanapāla's Commentary. Prakrit Text Series 21. Prakrit Text Society. Ahmedabad. Part II. B. L. Series No. 5. Delhi. Bhogilal Leherchand Institute of Indology.

Gallese, Vittorio (1999). From Grasping to Language: Mirror Neurons and the Origin of Social Communication. In *Toward a Science of Consciousness* III. Edited by Stuart R. Hameroff, Alfred W.

Kaszniak and David J. Chalmers. pp. 165–178. Cambridge. Massachusetts. Massachusetts Institute of Technology.

Gamkrelidze, Thomas V. and Vjačeslav V. Ivanov (1995). *Indo-European and the Indo-Europeans*. A Reconstruction and Historical Analysis of a Proto-Language and a Proto-Culture. Preface by Roman Jakobson. English version by Johanna Nichols. Berlin. Mouton de Gruyter.

Gee, George F. and Shirley E. Russman (1996). Reproductive Physiology. In *Cranes: their biology, husbandry and conservation*. Edited by David H. Ellis, George F. Gee and Claire M. Mirande. pp. 123–136. Washington, DC. U.S. Department of the Interior. National Biological Service. Baraboo. Wisconsin. International Crane Foundation.

Habib, Irfan (1982). In Tapan Raychaudhuri and Irfan Habib (Editors). *The Cambridge Economic History of India*. Vol. I: c. 1200–1750. Cambridge. Cambridge University Press.

Hailman, Jack P. (1977). *Optical Signals: Animal Communication and Light*. Bloomington. Indiana University Press.

Hammer, Niels (2003). *The Art of Sanskrit Poetry*. An Introduction to Language and Poetics Illustrated by Rasaḥ, Dhvaniḥ and Alaṅkāraḥ Analyses. Delhi. Munshiram Manoharlal.

Hemacandra (1972). *Abhidhānacintāmaṇi*. Herausgegeben, übersetzt und mit Anmerkungen begleitet von Otto Boehtlingk und Charles Rieu. Neudruck der Ausgabe 1847. Osnabrück. Biblio Verlag.

Hodgson, David (2002). Quantum Physics, Consciousness and Free Will. Chapter 4 in *The Oxford Handbook of Free Will*. Edited by Robert Kane. pp. 85–110. Oxford. Oxford University Press.

Hume, David (1739/1896). *A Treatise of Human Nature*. Volume II. Reprinted from the Original. Edited by L. Selby-Bigge. Oxford. At the Clarendon Press.

Kālidāsa (1969). (10th edition). *Abhijñānaśākuntalam*. With Commentary of Rāghavabhaṭṭa, Various Readings, Translation and Notes. Edited by M. R. Kale. Delhi. Motilal Banarsidass.

Kālidāsa (1969) (7th edition). *Meghadūta*. Text with Sanskrit Commentary of Mallinātha, English Translation, Notes and Appendices by M.R. Kale. Delhi. Motilal Banarsidass.

Kālidāsa (1972). (Reprint). *Raghuvaṃśa*. I-V. With the Commentary Sañjivanī of Mallinātha. Edited with English Translation and Notes by M.R. Kale. Delhi. Motilal Banarsidass.

Kālidāsa (1967). (2nd edition). *Ṛtusaṃhāra*. With Commentary by S. V. Upadhye. Introduction, Notes and Translation by M. R. Kale. Delhi. Motilal Banarsidass.

Kane, P. V. (1971). *History of Sanskrit Poetics*. Fourth Edition. Delhi. Motilal Banarsidass.

Kohler, Evelyne, Christian Keysers, M. Alessandra Umiltà, Leonardo Fogassi, Vittorio Gallese, Giacomo Rizzolatti. 2002. Hearing Sounds, Understanding Actions: Action Representation in Mirror Neurons. *Science*. 297. No. 2, pp. 846–848.

Leslie, Julia (1998). A Bird Bereaved: The Identity and Significance of Vālmīki's Krauñca. *Journal of Indian Philosophy*. 26, pp. 455–487.

Libet, Benjamin, Anthony Freeman and Keith Sutherland (Editors). (1999). The Volitional Brain, Towards a Neuroscience of Free Will. *Journal of Cosciousness Studies*. 6. August-September.

Mahābhārata. *Ādiparvan* (1933). Vol. I. Critical Edition. Edited by Vishnu S. Sukthankar. Poona. Bhandarkar Oriental Research Institute.

Mahābhārata. *Āraṇyaparvan* (1942). Vol. 3. Part 1. Critical Edition. Edited by Vishnu S. Sukthankar. Poona. Bhandarkar Oriental Research Institute.

Masica, Colin P. (1979). Aryan and non-Aryan elements in North Indian agriculture. In *Aryan and Non-Aryan in India*. Edited by Madhav M. Deshpande and Peter Edwin Hook. pp. 55–151. Ann Arbor. The University of Michigan.

Masson, J. (1969). Who Killed Cock Krauñca? Abhinavagupta's reflections on the origin of aesthetic experience. *Journal of the Oriental Institute. Baroda*. XVIII No. 3, pp. 207–224.

Mayrhofer, Manfred (2001). *Etymologisches Wörterbuch des Altindoarischen*. Band 3. Heidelberg. Carl Winter.

McAlpin, David W. (1979). Linguistic prehistory: The Dravidian Sitiuation. In *Aryan and Non-Aryan in India*. Edited by Madhav M. Deshpande and Peter Edwin Hook. pp. 175–188. Ann Arbor. The University of Michigan.

McEvedy, Colin, and Richard Jones (1978). *Atlas of World Population History*. Penguin Reference Books.

Meine, Curt D. and George W. Archibald (Editors) (1996). *The cranes: Status survey and conservation action plan*. The Sarus crane. IUCN. Gland and Cambridge. Northern Prairie Wildlife Research Center.

Mukherjee, Aeshita (2002a). Observations of the mating behaviour of the Indian Sarus crane *Grus antigone antigone* in the wild. *Journal of the Bombay Natural History Society*. 99. No 1, pp. 108–113.

Mukherjee, C. K. Borad and B. M. Parasharya (2002b). Breeding performance of the Indian sarus crane in the agricultural landscape of western India. *Biological Conservation*. 105, pp. 263–269.

Mukherjee, C. K. Borad, B. M. Parasharya and V. C. Soni (2001). Factors affecting distribution of the Sarus crane *Grus antigone antigone* (Linn) in Kheda District, Gujarat. *Journal of the Bombay Natural History Society*. 98. No 3, pp. 379–384.

Nagel, Thomas (1974). What is it like to be a bat? *The Philosophical Review*. 83, pp. 435–450.

Nāṭyaśāstra of Bharatamuni with the Abhinavabhāratī (1988). Commentary by Abhinavagupta. Vol. I. Chapters 1–7. Edited with introduction by R. S. Nagar. Parimal Sanskrit Series No 4. Delhi. Parimal Publications.

Panksepp, Jaak (1998a). *Affective Neuroscience. The Foundations of Human and Animal Emotions*. New York. Oxford University Press.

Panksepp, Jaak (1998b). The Periconscious Substrates of Consciousness: Affective States and the Evolutionary Origins of the Self. *Journal of Consciousness Studies*. 5. No 5/6, pp. 566–582.

Panksepp, Jaak. (2003). At the interface of the affective, behavioral and cognitive neurosciences: Decoding the emotional feelings of the brain. *Brain and Cognition* 52, pp. 4–14.

Panksepp, Jaak, Eric Nelson, and Marni Bekkedal (1997). Brain Systems for the Mediation of Social Separation-Distress and Social-Reward. Evolutionary Antecedents and Neuropeptide Intermediaries. *Annals of the New York Academy of Sciences*. 807, pp. 78–100.

Patañjali (1961). *The Science of Yoga*. The Yogasūtras of Patañjali in Sanskrit with Transliteration in Roman, Translation and Commentary in English. I.K. Taimni. Adyar. The Theosophical Publishing House.

Raghavan, V. (1963). *Bhoja's Śṛṅgāra Prakāśa*. Madras. Punarvasu.

Raghavan, V. (1975) (Third revised edition). *The Number of Rasas*. The Adyar Library Series. Volume 23. Madras. The Adyar Library and Research Centre.

Rudraṭa (1886). *Kāvyālaṅkāra*. With the Commentary of Namisādhu. Edited by Durgāprasāda and Wasudev Laxmaṇ Śāstrī Paṇśikar. Kāvyamāla 2. Bombay. The Nirṇaya Sāgara Press. (Reprint: Motilal Banarsidass).

Shanon, Benny (2002). *The Antipodes of the Mind*. Charting the Phenomenology of the Ayahuasca Experience. Oxford. Oxford University Press.

Sheets-Johnstone, Maxine (1998). Consciousness: A Natural History. *Journal of Consciousness Studies*. 5. No 3, pp. 260–294.

Sheets-Johnstone, Maxine (1999). Emotion and Movement. *Journal of Consciousness Studies*. 6. November/December, pp. 259–277.

Singh, G., R. D. Joshi, S. K. Chopra and A. B. Singh (1974). Late Quaternary History of Vegetation and Climate of the Rajasthan Desert, India. *Philosophical Transactions of the Royal Society of London*. Ser. B. 267, pp. 467–501.

Staal, Frits (1985). Mantras and Bird Songs. *Journal of the American Oriental Society*. 105. No 30, pp. 549–558.

Tranströmer, Tomas (2002). *Samlade dikter* 1954–1996. Viborg. Albert Bonniers Förlag.

Tyack, Peter L. (2000). Functional Aspects of Cetacean Communication. In *Cetacean Societies, Field Studies of Dolphins and Whales*. Edited by Janet Mann, Richard C. Connor, Peter L. Tyack and Hal Whitehead. pp. 270–307. Chicago. University of Chicago Press.

Vālmīki (1982) (1958 1st edition). *The Vālmīki-Rāmāyaṇa*. Vol. I. *The Bālakāṇḍa*. Critical Edition. Edited by G. H. Bhatt. Baroda. Oriental Institute.

Vālmīki (1963). *The Vālmīki-Rāmāyaṇa*. Vol. III. The *Araṇyakāṇḍa*. Critical Edition. Edited by P. C. Divanji. Baroda. Oriental Institute.

Vālmīki (1888). *The Rāmāyaṇa of Vālmīki*. With the Commentary (Tilaka) of Rāma. Part I. 1. The Bālakāṇḍa. 2. The Ayodhyākāṇḍa. 3. The Araṇyakāṇḍa. 4. The Kishkindhākāṇḍa. Edited by Kāśīnāth Pāṇdurang Parab. Bombay. Nirṇaya-Sāgara Press.

Vidyādhara (1903). *The Ekāvalī*. With the Commentary, Tarala, of Mallinātha and with a critical Notice of Manuscripts, Introduction and Critical and Explanatory Notes by Kamalāśaṅkara Prāṇaśaṅkara Trivedī. Bombay Sanskrit Series No. 63. Bombay. Government Central Book Depot.

Walkinshaw, Lawrence (1973). *Cranes of the World*. New York. Winchester Press.

Watt, Douglas F. (1999). At the Intersection of Emotion and Consciousness: Affective Neuroscience and Extended Reticular Thalamic Activating System (ERTAS) Theories of Consciousness. In *Toward a Science of Consciousness III*. The Third Tuscon Discussions and Debates. Edited by Stuart R. Hameroff, Alfred W. Kaszniak and David J. Chalmers. pp. 215–229. Cambridge. Massachusetts. Massachusetts Institute of Technology.

Watt, D. F. (1998). *Emotion and Consciousness*: Implications of Affective Neuroscience for Extended Reticular Thalamic Activating System Theories of Consciousness. http//:www.phil.vt.edu/ASSC/watt/default.html