The Origins of Music

eds. Nils L. Wallin, Bjorn Merker, and Steven Brown
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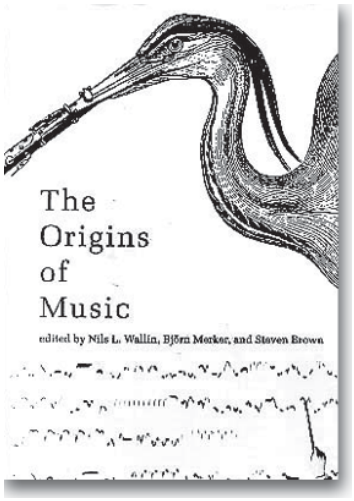
The editors and contributors of *The Origins of Music* leave no doubt that for them, music deserves to be taken seriously not only by musicologists, musicians and other imaginative minds such as the followers of various metaphysical quests. The range of topics is mindboggling, and so are the backgrounds of the authors who have set out to familiarise us with the latest findings in their respective fields. At the same time, this is a book which raises at least as many questions as it tries to answer; but isn't this the case with any book that takes its readers seriously? *The Origins of Music* has been divided into six sections. The titles chosen for these sections are a good indicator of its editors' intentions. Between sections I 'An Introduction to Evolutionary Musicology' and VI 'The End of the Beginning', a systematic approach becomes evident in the arrangement of twenty-five papers covering a variety of topics. Anybody interested in the art, psychology and science of music will find something to profit from: section II is devoted to 'Vocal Communication in Animals'; III to 'Music, Language, and Human Evolution'; IV to 'Theories of Music Origin', and V to 'Universals in Music'. Senior music anthropologist Bruno Nettl sounds a note of caution:

> 'A group of simple styles with limited scalar structure, and forms consisting of one or two repeated phrases, and found in virtually all known musics, may be the contemporary phenomena closest to the earliest human music. However, musical universals can provide only the most tentative guide to the origins of music. (Abstract, p. 463)'



In his highly informative paper, Nettl wonders 'whether what we now call music came into existence only once or in one way.' Those familiar with the Indian theories and myths about the nature and origin of music will recognize their own dilemma of trying to pinpoint the phenomena encompassed by the English word 'music'.

One of the main subjects of the book, namely Biomusicology, requires some elucidation. It comes in the form of a chart (Figure 1.1, p.5) wherein Biomusicology is supported by, or derived from, three more conventional branches of scientific research: Evolutionary Musicology, Neuromusicology, and Comparative Musicology. This arrangement provides all contributors a common ground. Students of 'world music' have respected some of them for several decades, notably Simha Arom ('Prolegomena to a Biomusicology') and Bruno Nettl ('An Ethnomusicologist Contemplates Universals in Musical Sound and Musical Culture'). Quite naturally, and even refreshingly so, *The Origins of Music* is devoid of uniformity of style, method and presentation. This fact is explained by the fact that the authors belong to diverse scientific disciplines and were brought together in a pioneering workshop entitled 'The Origins of Music' at the Institute for Biomusicology in Fiesole (Italy) in 1995. The project resulted from a 'long-standing curiosity on the part of a musicologist regarding what light modern neuroscience might shed on questions such as the origins, evolutionary development, and purposes of music, questions that he (Nils L. Wallin, co-editor) felt were incompletely dealt with by his discipline.' (Preface, p. ix) The editors express their hope that more students and researchers will choose to train both in the arts and in the experimental sciences such as biology. Practical benefits would include 'applied biomusicology', for instance in medical and psychological treatment, and 'the potential use of music as a general enhancer of learning'. The last objective merits special attention in the context of problems encountered in modern or urban Indian society. In Indian cultural tradition, and perhaps more so than in any other civilization, music has often been a unifying factor, whether in historical, geographical, social or metaphysical terms. Much lipservice has been paid to it in recent times, but perhaps with little practical effect. This fact deserves to be highlighted since Indian musicians have consistently made unique and creative contributions which have not even got them recognition at home in the way works of their counterparts have, elsewhere in the world. And more importantly, their inputs can vastly improve efficiency in education and aid social integration at comparatively low costs. To be considered partners in such a scheme musicians need to demonstrate their sensitivity to social issues and modern society.

The findings of science, such as those summarised in *The Origins of Music*, will enable musicians, music teachers and theorists to redefine and articulate their role in modern society and help them recapture the tradition better. Of course, to do justice to classical Indian music one requires a good grasp of repertoire, history, technique, stylistic detail, and music theory; but to define a new role for themselves, musicians and educationists need to

become more forward looking, develop a broader outlook, and sharpen their intellectual and critical faculties. If these attributes remain the prerogative of the elite, and devoid of any sense of shared purpose and equal responsibility (as seems to be the case at present), musicians will face stiff competition from the electronic media.

The introduction to *The Origins of Music* provides a good overview of major issues: '*The Question of Animal Song, Music Evolution versus Language Evolution*', '*Selection Mechanisms for Music*', '*The Evolution of Meter*', '*Absolute Pitch*', '*Musical Universals*' and the various '*Methods in Evolutionary Musicology*' (e.g. musical archeology, Human Brain Imaging, and Comparative Musicology). The chapter '*Music Evolution: Biological versus Cultural*' is also discussed in some detail here. It highlights the difference of viewpoints between ethnomusicologists, 'to preserve the image that the music of a given culture is individual and special', and evolutionary musicologists, 'to use music as a tool to study human evolution' and finally admits that: However, 'classification should not be viewed as an academic exercise for its own sake, nor as a device for suppressing and denigrating cultures, but as an important tool for understanding the deep roots of musical styles and thus human behaviour in general'. All music lovers are at some point or the other likely to have pondered over questions such as when and how did music become what we know it to be today?, 'why is music so important in modern society, making it a major global industry?, or 'is music really indispensible to human existence?' Few of us would argue with anthropologist E.T. Hall who, in his revealing study *Beyond Culture* observed: 'In a sense ... man's relationship to all the art forms is much more intimate than is commonly supposed; man is art and vice versa. There is no way the two can be separated. The whole notion that the two are separate is another example of extension transference (and probably an aberration of Western culture).' Any attempt to increase musical awareness and effectiveness is bound to be accompanied by an investigation into lifestyle, culture, and civilization in general. I am reminded of Hermann Hesse, the great German novelist and nephew of Hermann Gundert, the Malayalam scholar, who was deeply interested in Indian culture and philosophy. In the Nobel Prize winning novel *Magister Ludi* (The Master Player), also known as '*The Glass Bead Game*', he articulates his thoughts on what life ought to be by using music as an analogy. Thus his hero says: 'My life, I resolved, ought to be a perpetual transcending, a progression from stage to stage; I wanted it to pass through one area after the next, leaving each behind, as music moves on from theme to theme, from tempo to tempo, playing each out to the end, completing each

and leaving it behind, never tiring, never sleeping, forever wakeful, forever in the present.' Along with language and literature, music has often been used as a measure to gauge how a civilized society functions. It is commonly thought that certain musical features are shared by most if not all cultures (ref. the 'universals' discussed in Section V, '*Universals in Music*'). Section I, '*The Beginning*', contains an '*Introduction to Evolutionary Musicology*' by the editors who reiterate the familiar perception that 'Music making is the quintessential human cultural activity, and music is an ubiquitous element in all cultures large and small.' Although they admit that 'there is no agreed-upon answer' to the question 'what is music'? they insist that 'Music offers important insight into the study of human origins and human history in at least three principal areas' among which figure 'universal and multifunctional cultural behaviour'. They argue that: 'Even the most cursory glance at life in traditional cultures is sufficient to demonstrate that music and dance are essential components of most social behaviours, everything from hunting and herding to story telling and playing. (p.41)'

The study of the evolution of language they add, 'has much to gain from a joint consideration of music', and 'music has much to contribute to a study of human migration patterns and the history of cultural contacts.' The implications of this statement cannot be stressed enough in view of the exaggerated emphasis placed these days on ethnic or linguistic identities. We know how much misery is inflicted upon millions of people the world over, people who are marginalized in their own countries or place of birth, and often find themselves in the position of belonging to one undesirable 'minority' or another, alienated from the mainstream of society for no fault of their own. Greater understanding of the history of cultural contacts can certainly help bring people together where other means have failed. A valuable feature of *The Origins of Music* is the information provided on recent research findings about the functioning of the human brain. It confirms a belief widely held in India—that the association of language, music and memory is indeed natural. The association between the three is rooted in the process our brain has evolved. (see Dean Falk's paper, '*Hominid Brain Evolution and the Origins of Music*', '*Can Biomusicology Learn from Language Evolution Studies*' by Derek Bickerton; and '*Toward an Evolutionary Theory of Music and Language'* by Jean Molino.) In Falk's paper there is a quotation from Darwin who was sceptical about the evolutionary purpose and history of music.

Music did not fit into his overall scheme of things–implications which were however, too far fetched by modern civilization:

> As neither the enjoyment nor the capacity of producing musical notes are faculties of the least direct use to man in reference to his ordinary habits of life, they must be ranked amongst the most mysterious with which he is endowed ... we have every reason to believe that man possessed these faculties at a very remote period, for singing and music are extremely ancient arts. (*The Descent of Man, and Selection in Relation to Sex,* 1871).

Geoffrey Miller, in his paper 'Evolution of Human Music through Sexual Selection,' revisits the theories of Charles Darwin in the light of modern science. Darwin's 'patronizing Victorian attitude toward non-European music' are questioned just like his preoccupation with the supposed origin of musical tones and rhythm in the 'season of courtship'. Most readers will probably not be familiar with disciplines such as 'Biomusicology' (Preface) or 'Evolutionary Musicology' (Chapter 1). The contributors to this volume might be aware of the fact but, their writings are bound to change the way curious readers think about the phenomenon of music. These discourses built upon the underlying questions such as 'what prompts man and animal alike to produce particular sounds and respond to music', or 'what does music mean to them?' The essayists provide us with a number of interesting observations rather than final answers to such queries. Jean Molino, in his paper entitled 'Toward an Evolutionary Theory of Music and Language,' cautions readers about the danger of an approach based on the structure of human music as we see it: 'if we define music according to structures of the European tradition, we commit a grave methodological error, because nothing guarantees that this conception has any kind of universal validity.' One should add here that any generalisation based on Indian 'classical' music would be equally fallacious. Jean Molino further argues that 'it is significant to consider that anthropologists, who insist on the eminently variable nature of cultural phenomena, do not go to the point of placing in question the unity of human music. We really believe we know what music is, even though ethnomusicologists themselves have taught us that in many cultures no word exists that corresponds to what we know of as music, and that we are obliged to put under the vague term of 'music' very different types of practices (p.68).'

Generalisations and simplifications are thus not what this book is all about. On the contrary, its strength lies in the fact that commonly held, but rarely substantiated beliefs, are being questioned here.

> 'It has been taught since Pythagoras, and it is still believed by some, that heptatonic [i.e. seven-note] scales express a natural law. In particular, theoreticians maintain that a perfect chord built upon them is given by nature, since the third and the fifth overtones of many musical sounds seem to sound like the fifth and third tones above the root. But the minor third, as frequent as the major one, can be identified only with the nineteenth overtone, and the fourth degree, one of the pillars of the tonal temple, corresponds but vaguely to the eleventh overtone (minus a quarter-tone) or to the twenty-first (minus twenty-nine cents). Anyhow, nobody has ever heard such high overtones, which represent sounds alien even to the chromatic scale ... In spite of all that, many theoreticians two centuries after Rameau keep teaching this acrobatic theory of natural resonance, ignoring the fact that a wide diversity of intervals and pitch steps are used in the different scales of different cultures (p.474).'

The difference between animal and human music is perceived as one of degree rather than of substance, at least when it comes to the species discussed in this book. According to Indian mythology, birds guard many secrets. For those researching the recurrent themes and characters specific to Indian arts there are some interesting deliberations regarding the range of vocal and other types of expression documented among apes and birds:

> 'Our closest living relatives, the great apes, communicate more by gesture and by facial expression than by sound. They have loud vocal displays, such as the pant-hoot of chimpanzees (Pan troglodytes), but these are far from elaborate or musical. ... does analogy with birds help to suggest why singing and other musical attributes in humans may have arisen? ... Do birds produce music? This is not an easy question to answer, partly because no definition of music seems to be universally agreed upon. ... It is suggested from time to time that the songs of some birds that seem to us especially beautiful may be more so than is strictly necessary for their biological function. Could this indicate some primitive aesthetic sense, and that the bird is taking pleasure in song for its own sake? ... When it comes to animals, however, we have no access to their inner feelings, so the question can only be a matter of speculation. (pp.59-61)'

Indian myths, by purpose and nature, often command a willing suspension of disbelief. But it is not only in India where stories such as these propound a scheme wherein everything from the inanimate to animals, humans, the

superhuman and divine partake in music, each in accordance with their faculties and aspirations. Therefore it is refreshing to find one researcher ask the question 'Do Animals Make Music?' in a straightforward fashion and it is intriguing to learn that 'songbirds, with their learned songs, have a developmental strategy with all the hallmarks of a truly creative process. ... Many different sequences are created, generating, in effect, a kind of animal music (p.45).' Then there is Katharine Payne's observation that 'male humpback whales sing long, complex songs ... that evolve continuously ... so rapidly that nonreversing changes can be measured from month to month in a singing season.' Such changes 'seem to arise through improvisation and imitation rather than through accident or as conveyors of information.'

Poetry that inspired followers of the *bhakti* movement has for centuries been allied with major artistic developments in India. In the *Bhāgavata Purāṇa*, for instance, we learn of the power of Kṛṣṇa's divine flute making music that enchants human beings and cows alike. The lyrics of several Carnatic compositions, for instance *Nādopāsana* and *Mokṣamu Galada*, two *kṛtis* of Tyāgarāja, even prescribe that the musician perceive subtle facets of music, and ultimately that of cosmic sound (*nāda*) for leading a fulfilled life. Such sensitivity is also a pre-requisite to cultivating spiritual awareness and attaining the self-realisation that leads to liberation (*mokṣa*). Here music, or rather a clear perception of the psycho-physio basis of all music making, is viewed as part of any individual's 'evolution'. Simha Arom argues that even great Indian classical musicians have insisted on observing certain formal processes:

> How can we decide if there is or is not a type of continuity between zoomusicology ... and what one would have to call anthropomusicology, which would be the scientific discipline, supposing we could create it, that would deal with the suite of human musical properties as they are manifested in the ensemble of known musics? ... In conclusion, it seems to me that if a biomusicology is possible, it must be able to integrate in one way or another, certain of the criteria enumerated above [formal process, formalization of time, musical scale, ordered and simultaneous interaction, repertoires], by combining them by at least two. ('Prolegomena to a Biomusicology', p.27).

Anjaneya is the name of a writer on music and dance referred to in ancient treatises by Nārada, *Śārṅgadeva* and several other authorities on music, including the learned composer Tyāgarāja (1767-1847). With the spread of the Rāmāyaṇa Hanumān or *Ā*njaneya became one of the most beloved and colourful characters in Asian literature, iconography, music and drama.

He is thus associated with musical understanding, traditional wisdom as well as superhuman powers. For anyone fascinated by Hanumān's association with music, Thomas Geissmann's 'Gibbon Songs and Human Music from an Evolutionary Perspective' provides rare insights into the theories of evolution of primates and man (Chapter 7). He states that 'a cross-species comparison reveals that singing behaviour evolved several times independently in the order of primates.' Under the sub-heading 'A Link to Human Music', he draws attention to the fact that, among other functions, loud calls serves the purpose of intragroup intimidation as well as cohesion. Music can display and reinforce the unity within social groups and conveys their solidarity with other groups which 'is still evident today whenever groups of people, be they united by political, religious, age, or other factors, define themselves by their music'. He lists examples such as national hymns, military music and the musical preferences of youth gangs 'the origins of which may go back to the very beginning of human evolution.' Derek Bickereton, in a chapter, entitled 'Can Biomusicology Learn from Language Evolution Studies' makes an important point:

> biomusicology should not jump to the conclusion that the features of music necessarily evolved gradually and were selected for over a long period of time, the time during which music as we know it today was slowly developing. Some features may indeed have evolved in this way; others may not ...

This observation also becomes relevant for the debate over the supposedly 'ancient' origins of all manifestations of Indian culture. Such assumptions are increasingly getting charged emotionally and politically and, in the absence of historical evidence or clear definitions, have even been equated with Indianness and national pride. A book as well documented thus makes rewarding reading for a variety of reasons. First and foremost, it builds bridges between several fields of research—a boon for any person immersed in a cultural pursuit rather than natural science. It demonstrates how important it is to stay in touch with modern science in order to make meaningful choices and to form opinions on the basis of information rather than sentiment. Although this book has a lot to say about the impulses that lead to the making and enjoyment of music, the underlying themes also connects us with other realms—factors that influence social behaviour, and the role of memory in human urges and activities.

Darwin's influence, unlike that of Freud or Marx, has far from waned, as this book tellingly demonstrates. While his competitors have been obliterated in our collective memory, Darwin's theory of evolution has had a great impact

in several areas of research. It continues to provide a framework within which biologists, among other scientists, gauge the motives of man and beast alike. But we can still take heart from some of the hypotheses and observations proposed in this volume, that, there is still something to keep us going in our respective pursuit in the arts and humanities:

> Clearly, in many cases the syntax of animal signals has something in common with music. I think that nearly all processes involving repetition - an obvious universal in music - can be encountered among animals: refrains, rhymes, symmetry, reprises, Liedform, Barform, and so on. My view that we are dealing with a functional similarity in animal species and human often meets some objections ... My answer is first that the idea of a gratuitous aesthetic pleasure is but a very small part of musical behaviour in humans. It took on special importance only one or two centuries ago, in European civilization. Many musical traditions have no idea of what a concert is. ... Many cultures make music only in ritual contexts. ...The views that the ethnologist Sebeok (1975) expressed seem to support such a thesis, which I submit to more expert specialists. It implies that the whole elaboration of a culture, meaning a collective structure of symbolic imagination, might stem from this lavishness of nature exceeding its limited basic purposes (p.478).

Observations like these also help to understand and appreciate more keenly the immense variety of music in India: not only ritual music, but also the various types of applied and devotional music found in many regions of India alongside modern 'concert music'. Dean Falk's 'Hominid Brain Evolution and the Origins of Music' carries an illustration of two highly informative figures which are meant to depict the hemispheres of the human brain. The recent findings on brain research have proved exciting for all those concerned with practising music, not only as musicians, musicologists or music teachers but also for those who work in fields where music transcends the sphere of cultivated leisure. Deploying music in psychotherapeutic practice, for rehabilitation of the physically and mentally handicapped, social integration or drug de-addiction programmes will certainly benefit from insights into the way the brain processes music:

> Recent applications of medical imaging technology using positron emission tomography (PET) and functional magnetic resonance imaging (fMRI) have made it possible to assess brain activity in human subjects as they perform specific cognitive tasks. ... despite their different

> dependence on the left and right hemispheres, language and music 'time share' many neurological underpinnings.

Yet practitioners and students of Indian music will wonder why there should be 'a surprise in the above recent findings', i.e. 'the extent to which musical activities engage the left hemisphere in a manner that parallels the processing of language.' After all, it is not only Indian classical music which is generally based on lyrics, whether articulated by a singer, or expressed by means of an instrument:

> Melody and rhythm appear to be neurologically dissociated ... with the left hemisphere apparently better at processing the latter. The right hemisphere also provides and interprets the melodic nuances of speech, the tone of voice, that is important for conveying affective or emotional connotations of speech.

An ancient belief in the value of imparting some early music training to all, and not just the gifted or priveleged ones, by strongly endorsed the *bhakti* movement, also acquires a unique significance:

> a number of gross anatomical differences were discovered that distinguish the brains of musicians from those of non-musicians. ... musicians rely more on the left hemisphere to process certain aspects of music, such as melody, that are largely the domain of the right hemisphere in nonmusicians (p.206).

A remarkable paper by Ellen Dissanayake titled 'Antecedents of the Temporal Arts in Early Mother-Infant Interaction' It is a treasure house of information on vocal timbre, rhythm and emotion. The following short quote must suffice to indicate the density of observations proposed in this paper: 'We can, I believe with good reason, claim that mother-infant interactions are composed of elements that are literal, not just metaphorically, musical.' Sandra Trehub's paper 'Human Processing Predisposition and Musical Universals' provides us with rare and well documented insights into the ways we process and retain music, why certain scale structures are preferred, and why rhythms have their foundation in culture rather than in nature. Rhythmic diversity, for instance, is most conspicuous in Indian performing arts, reflecting the enormous ethnic and linguistic diversity of the land; whereas a relatively small group of popular *rāgas*, and the moods associated with them, provides a set of common denominators. These bridge the various cultural and ethnic boundaries of India throughout the history of her music. Sandra Trehub's observations about the way mothers use their voices when singing lullabies

to their children, and how such songs are preferred by infants to adult songs or even play songs will prove valuable to parents, educationists, and those involved in any type of therapy. The innately subtle nature of auditory perception among all human beings is sure to have considerable implications in the way we expose children to sound and music, whether at home, in schools, in places of worship, or in public.

Sandra Trehub's paper 'Music for Infants' summarises prominent findings of several researchers about the way feelings alter the character of a person's voice to the extent that an emotional state cannot normally be masked by conscious manipulation of one's voice:

> Even when parents (fathers as well as mothers) attempt to reproduce or simulate their usual performance to infants, but with no infant present, listeners can still distinguish the genuine or contextually appropriate version from simulation ... Vocal adjustments such as these [pitch, tempo] do not depend on the singer's parental status but are evident as well in songs sung by young children to their infant siblings (p.428).

The degree of (un) well-being caused by exposure to certain types of music has important implications for individuals and decision makers alike. It is interesting to learn that the 'convergence of empirical findings from our laboratory with cross-cultural evidence and with the admittedly speculative historical record makes an intriguing case for the biological basis of at least some musical principles (p.442).'

The Origins of Music is a book which demonstrates that music is more than an arrangement of patterns of sounds—it is a complex phenomenon which has aspects that music lovers or even practitioners not fully aware of. It has yet to yield all of its secrets to mankind. The key to unlocking its mysteries lie in the human mind, and to use the key requires a better understanding of how the human / animal brain functions. The papers in this volume are far from drab, and convey effectively the enthusiasm the authors have brought to bear on their respective disciplines. A case in point is Katharine Payne's: 'The Progressively Changing Songs of Humpback Whales: A Window on the Creative Process in a Wild Animal':

> I can imagine many questions that human composers would like to ask whales. It would be nice to know, for instance, whether whales are aware of intentions as they compose and sing, and how they experience their own and other whales' songs. In deep water, when the sea is calm and singing whales are a certain distance away, all the sounds are resonant and followed by echoes - from the bottom of the sea, from the walls of

> underwater mountains, and from the under surface of waves. ... From the perspective of a person interested in music, these are important questions, but we may never be able to answer them fully (p.147-50).

While the highly technical data presented in the book may appear intimidating, albeit befitting a publication from MIT Press, the book ends on a note as lyrical and optimistic as befitting its subject:

> Whatever those functions are that made music into a human necessity, they are universal. They are felt and understood by all, even if the sounds that support them differ in superficial ways. ... We are all, in fact, saying the same things to each other but using different sounds to say them. This is no less true of our musics. ... And just like those fragile moments that follow the ending of a sheeringly beautiful piece of music, it is hoped that the melody and the rhythm of this book will linger for a while to come ... and perhaps even fill your dreams (p.484).

The Origins of Music will prove a valuable acquisition for any institute of advanced learning, and not only in the fields of music, art and education; teachers, students and professionals in fields as diverse as ethnography, anthropology, archaeology, psychology, sociology, and linguistics will equally profit from the valuable nuggets of information documented in this book. Especially noteworthy are chapters dealing with recent discoveries about the way we feel, communicate, listen, speak, and relate to the world around us. The authors proceed conscientiously rather than jumping to conclusions. This is what makes this book so remarkable as a trustworthy source for future reference and research. Far from making the world appear to be a colder, more impersonal place to inhabit, as science writers can do at times, the contributors to this book have succeeded in adding colour and perspective to their readers' perceptions, not to forget a sense of urgency, passion and enchantment.

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