

CULTURAL EVOLUTION

A Case Study of Indian Music

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This paper studies the relations between a specific part of culture and the society which surrounds it. As an example I use the classical music of North India, but I shall try to show that a similar approach may be relevant to other entities within a culture, e.g. science. In this article I concentrate on change in culture and society.

Revolution and change

The complications involved in a study of social or cultural change can be realized if we see the vast amount of different and often contradictory theories about the phenomenon. Percy S. Cohen, after summarizing a number of these theories, comes to the conclusion that there is no single theory which can explain social change: "Social systems can provide many sources of change" (1968:204). This confusion is mainly due to the conceptual difficulties involved in the idea of change. Change is related to continuity, it describes a divergence from what we would normally consider non-change. Frederick Barth makes this clear when he says: "For every analysis (of change) it is therefore necessary for us to make explicit our assertions about the nature of continuity" (1967:665). Change is irrevertibly connected to the progression of time. Hence we can only distinguish between degrees of change, which we have to relate to a fictive projection of what continuity is. This appears also from Cohen's suggestion that we should distinguish between minor changes (which he considers part of persistence) and fundamental changes (which are genuine changes of the system) (1968: 175-8).

A classical and powerful idea concerning change is that of evolution. It is a comprehensive way of understanding change, which has been neatly summed up by Robert A. Nishbet. In social evolutionism change is seen as

natural, directional, immanent, continuous, necessary and proceeding from uniform causes. (1969: 166-188). That change is natural and necessary we may accept as a premise. The other points are subject of much controversy in scientific enquiry. The immanence of change, i.e. the idea that it is contained within an entity (e.g. a society), has been disputed by the "diffusionists", who consider it the greatest weakness in social evolutionism. Continuity and discontinuity in change have recently been integrated into an evolutionary perspective by W.F. Wertheim, who considers revolution a specific variety of evolution (1971: *passim*). Direction was the main interest of the 19th century evolutionists, whereas the causes, or mechanism have received some attention from the "neo-evolutionists", like White and Steward (Nisbet 1969: 226).

In biology evolutionary thinking has concentrated strongly on mechanisms, and I suggest that in social science a model can be built on simple parallels to the biological view. Some biologists have hinted in this direction (see e.g. Waddington, 1960, Huxley 1947), but in social science the model has been strongly neglected, due to various faulty applications that have led to great misunderstanding.

The first problem is that we must make clear on which level we study evolution. The idea is, I think for social science as much as for biology, that evolution is found at all levels. Life evolves, a species evolves, organs evolve. Similarly, society evolves, sub-cultures evolve, aspects of culture evolve. However on the more encompassing levels such as life or society, a philosopher will have more scope to speak than a simple scientist.

The second problem is the application of the selection hypothesis in social studies. The concept of survival of the fittest has been applied to human beings — resulting in rather amoral ideas. (see e.g. Hofstadter on Spencer 1955: 40-41).

In the third place, the selection hypothesis or, in its more refined form, the ideas of ecological pressure and adaptation, has not been linked up with a model of "cultural genetics", and variation and mutation therein. Julien Steward's work (1955) for instance concentrates on adaptation to the environment. However no-where is the actual process of adaptation shown by him, only the adapted state.

Fourth, we must be fully aware that evolution as a long-term process, in which we mainly concentrate on direction, cannot be really proved or disproved, since our knowledge of the past is far too scanty. On the other hand the study of mechanisms is micro-sociological, and derives from detailed observations of processes on short term. To link up the mechanistic approach with a directional view is very difficult, in sociology as much as in biology. The search for uniform causes in cultural change can however give insight into

the meaning of direction in evolution, which otherwise is little more than an outline of history.

Fifth, it is thought that not all processes are evolution. Particularly the idea of direction in evolution means that some scientists have equated evolution with those processes that go into the direction they see in evolution. Other processes are then seen as degeneration or regression. However I suggest that all processes in culture can be studied from an evolutionary point of view. That which is called degeneration is a specific variety of evolution. The question is: *How* do we see processes as evolution, not: *Which* processes do we call evolution.

In the subsequent parts of this paper I shall give a brief outline of an evolutionary model for the explanation of cultural change, as derived from biology. This will be illustrated by the case-study of Indian music. Next I shall try to indicate in how far this approach may be applied to aspects of culture in general. The final part is an essay to integrate the mechanistic approach and a directional view.

Mechanisms of Change: An Evolutionary Model²

1. *The hereditary system:* Culture is transmitted through teaching, socialization, indoctrination etc. Most views on culture describe it as social heredity.

2. *Variations and mutations:* Within a certain population (a cultural niche) aspects of culture are not identical in each sub-population or each person. E.g. each person has his own vocabulary and each sub-culture has its own vocabulary, which is the totality of words used by persons belonging to this sub-culture. The totality of the vocabulary of the whole language is again the sum of words used in each sub-culture.

Mutations are a specific type of variation. In culture we can compare this to creation and innovation. Many innovations are purely variations — they are new combinations of existing elements. Although the nature and emergency of creations are unpredictable their role in cultural change has been stressed by several authors. Sorokin considers creativity the main factor in sociocultural change (1965: 89-90). Devaraja is of the same opinion (1963: 124-140). He sees the creative genius as the agent of progress, but compares him to an onlooker to a chess-game. The players may or may not accept his suggestions (1963: 133). In this sense he realizes the importance of the selective environment, which seems unnoticed by Sorokin.

Apart from the creative element, mutations can also involve reduction, either as a conscious simplification, or through flaws in the hereditary system.

3. *Selection, ecological pressure* : The composition of the totality of culture or an aspect thereof is influenced by the environment, i.e. the persons using this culture. Certain creations or new combinations (variations) will suit the needs of the persons living in the cultural niche and hence bloom, other creations will disappear. The nature of ecological pressure will change when the environment itself changes.

So far the model runs parallel to that of biology, however there are some major differences.

A. *Diffusion*: A new creation can be immediately communicated. Cultural inheritance is effective at all times, not only at the moment of procreation. Lamarckism is more appropriate to culture than to biology. However it does not go against the evolutionary model. An "imported" change can be treated as a mutation — on which again the environment will exert its pressure.

B. *Intent*: Variation, mutation and selection in culture do not work purely by statistics. The desire to change, to solve problems and to innovate can induce variations and mutations, and can influence the nature of ecological pressure. Danielou, in an article on Indian music, rightly distinguishes between "haphazard" (statistic) and "conscious" evolution (1966: 11-15).

The issue we study may be at any level. We can study the evolution of a word, of a group of words, of a structural characteristic of a language, of a dialect, of a language or even of language. Whatever issue we choose for study, we see the issue as the evolving subject and everything else as environment. For practical purposes it will be necessary to select from this total environment. In aspects of culture obviously *man* is the basic environment, including the other aspects of culture he represents. We must be aware that the environmental pressure on the aspect of culture we study applies to the variations and mutations within this aspect of culture i.e. it does not apply to human beings. Indeed, a human being may be the "carrier" of a variation in this aspect of culture. This variation may be more or less "fit for survival", but it absolutely does not imply that that human being must be less "fit for survival". In fact the discriminating mind of the human being in question must be seen as a primary environment in which the variation of culture "lives" or is discarded.

The Case of Indian Music

Many authors use the word evolution, although in the rather loose sense of each stage in the history of music being conditioned by the foregoing stage. (articles of Deodhar, Ernest Meyer, Sambamoorthy, Shukla in *Music East and West* 1966: 16-22; 24-38, Prajnanananda 1973: 33-130, 279-293). Very little in Indian music is really fixed, and

we constantly see variation and mutation in front of our eyes. The long history of Indian music, in which it gradually unfolds from its earliest concepts into its present form makes an evolutionary view rather inevitable.

A complicated and interesting theory of the evolution of *Ragas* has been propounded by N.A. Jairazbhoy.³ He considers musical factors as the sole cause in this evolution (1971: 179). Somehow he seems to overlook that music does not make itself. Musical modes have to be created, invented or borrowed from outside. Then they have to become accepted by their environment: the musicians and the audiences. Of course this reality can only be studied in the present which is bluntly discarded by Jairazbhoy (1971: 179).

In this paper I shall illustrate the model of evolution by the following questions:

- (1) What is the hereditary system for music,
- (2) assuming the cultural whole to be static,
 - (a) how do variations and mutations manifest themselves in music,
 - (b) which pressures come from the cultural whole and how do they effect variations and mutations,
- (3) when the cultural whole is seen in motion how does environmental change effect variations and mutations,
- (4) do variations and mutations influence the environment?

In my description I have restricted myself mainly to the period from about 1900 to the present. Only for this period can information be cross-checked with musicians who lived through this period. Some gramophone recordings are available for the major part of this period, which enable us to say something about developments in musical style. In much of the descriptions the above questions will be found interwoven.

The Hereditary System and its Lapses : Mutations

Indian music is rich in subtleties and intricacies which cannot be written down. Even in teaching from person to person some differences between teacher and pupil remains inevitable. However, in the traditional system of teaching, where a pupil was learning for 10 to 20 years with a teacher much of the knowledge and style of the teacher was transmitted. Over the past decades the relation between teacher and pupil has changed. This has

resulted in a different command the younger generation has over music. In the following I describe this change and the reaction of the musical environment to it.

First of all values have changed relating to the teacher-pupil relation. Traditionally the pupil is totally subjected to the teacher. The teacher is supposed to know everything and the pupil nothing. The pupil has the desire to learn music and hence is completely dependent on the teacher. The subjection to and reverence for the teacher is expressed in the touching of the teacher's feet by the pupil upon meeting and parting. The position of supreme power of the teacher is however mitigated in some cases, when the pupil has social, economic or political resources to exercise power over the teacher. This happens where the pupil comes from a family which can be considered a family of patrons of music. At present a good number of students come from the new city-bourgeoisie, children from families of higher administrative personnel, doctors etc. They take the attitude of patrons of music and pay their teacher in such a way that he is dependent on them rather than the other way around. Such students usually know English and consider themselves superior to the teacher in many ways.

The musical effects of this change are several. The basic teaching is not as solid. The teacher cannot easily force the pupils to practise scales for a year or two. The voice therefore becomes less powerful and tuneful. Harsh criticisms, often linked with physical punishment is rather out of the question. This formerly ensured not only that the pupils learned music but they also *learned to learn* fast. At present the pupils are more relaxed, and take hours, sometimes days to learn a small piece. It is easily understood that such pupils can never acquire a fraction of the knowledge some traditional artists have. Further the pupil does not wholly accept the teachings of the teacher. He finds it more than sufficient to learn only practical items for the mass concerts, which are not as demanding as the concerts for small circles of experts in music. This last point needs some elaboration as it also explains how lesser knowledge of present-day artists is accepted. Before 1900 the audience of classical music was mainly restricted to a very small group of persons from the elite. It was performed in the Royal Courts and in the houses of rich persons of the nobility. The music performed in these circles was based on the assumption that the audience was conversant with its specific idiom. The established artists had great influence on their patrons, in the sense that they were consulted for the judgement of promising young artists. Due to various reasons the courts could not maintain their patronage of music. Gradually over the period from about 1900 to 1950 musicians had to leave the courts and seek employment in the big cities; Bombay, Calcutta, Delhi. During this same period new things emerged, the public concert, schools of music, radio and cinema, which gave new opportunities to musicians. The public concert and the radio allowed a different kind of music. In the courts the audience was small, and relatively expert. The

audience of public concerts (and of course the radio) is far more indifferent, anonymous and less expert. In the courts high demands were made from the extent of knowledge of the musician — he could be asked to perform specific pieces. The modern audience does not go for intricacies but rather for such generally appreciated aspects as speed in technique, (cf. Mukherji: 1948: 150-175). Apart from the above mentioned effects these lapses in the hereditary system bring about many reductions in music; some *ragas* are disappearing, certain embellishments become highly rare, many compositions will not be known to the next generation, *talas* disappear, a whole style, the *dhrupad*, seems to fade away and even the future of instruments like the *pakhawaj* (drum) and the *vina* (long-necked lute) is uncertain.

Innovations : Mutations II

Indian music is dynamic in nature. It allows innovations on a number of levels. A performance means the manifestation of a *raga*. Different artists have a different conception of *raga*.

Improvisation and innovation in *tana*, *bandish* or shape of the *alap* are part and parcel of Indian music. An artist who sings only known items is considered boring. However, as long as he sticks to known *ragas*, and stays closely in line with the traditional conception of the *ragas*, within a known style, improvisations and recombinations can barely be considered full-fledged creations. In fact much of these changes are variations in the sense that known musical material is employed in a new way. On the other hand the invention of a new *raga* or a new style can more truly be called a mutation. In the following I shall describe the process of invention of a new *raga* and the reaction of the environment to it.

The *ragas* have a number of characteristics, which could logically vary to result in thousands of *ragas*. Yet only about 60 to 90 appear to have enough innate qualities to be sung (or played) often. There are (and have been) constantly artists who introduce a new *raga* based on a change of characteristics of already existing *ragas*. Usually these *ragas* disappear into the grave with the inventor. This has led musicologists to wonder which phenomenon is at the basis of the fact that characteristics cannot be varied at free will. One of these questions concerns the notes which are used in a *raga*. The fact that there are twelve semitones in the octave, and that a *raga* may use four to seven of them in ascent and four to seven in descent already leads to thousands of possibilities. Dilip Chandra Veda (b. 1901) follows an interpretation of the *raga* system based on the internal harmony of notes used in the scale. It explains why a vast number of possible permutations of notes cannot be seen as practicable *ragas*, since it is necessary that the notes are all harmonically interrelated.

Veda has invented a *raga* himself.⁴ This *raga* of course obeys the rules

which dominate the *raga*-system as he sees it. After the introduction of the *raga* in 1926 there has been a lively discussion in music circles whether it should be accepted as a new *raga*. Some people rejected it saying that it was only a modulation of an existing *raga*.⁵ Others claimed it had already existed before. Again others said it was incorrect (unspecified). It took more than ten years before the discussion stopped and the *raga* was more or less accepted in music circles.

The introduction of a new *raga* not only attempts to establish a new scale and some characteristics. The artist must give flesh to it in the sense that he must define a way to sing the *alap*, he must create a *bandish* and he must provide *layakaris* and *tanas*. Dilip Chandra Veda fulfilled these requirements thoroughly. Moreover he taught all these aspects of his *raga* to a number of pupils who may keep the *raga* alive, that is, keep it from disappearing into the grave with the creator. Another reason why this *raga* has some chance of survival is that it has been recorded on gramophone and tape.

New *ragas* have a certain appeal to the public. This is due to a general fascination with novelties. If an artist in a concert announces that he is going to play a new *raga*, and explains the characteristics of it, the audience gets quite excited. However, the critics the day after the concert are usually harsh. More important is the fact that other musicians, the competitors and rivals of the artist who introduces the new *raga* will avoid singing or playing it. This would be the same as to acknowledge their own inferiority. Moreover they will induce their pupils not to sing this new *raga*. Hence only the pupils of the artist himself may learn the *raga*. But even in that case the composition and other aspects belonging to that *raga* will have to be very impressive or else the pupils will refrain from singing the *raga* in public. Thus we see that a newly invented *raga* may only get some wider acclaim several generations after the inventor. But it will take more than a century for a *raga* to become known to every musician.

Undoubtedly the invention of a *raga* involves a matter of prestige. It shows the creative and independent ability of an artist. Moreover some artists sign their name in the *raga* or the composition they have created which adds to their fame, and in a sense places them among the immortals. If we look at the amount of new *ragas* which have appeared during the last fifty years it would seem that creating a new *raga* is a more or less natural thing to do for an accomplished artist. During the 35 months I spent in India at least fifteen new *ragas* were introduced at concerts in Delhi. From the 19th century we have ample proof showing that in that time also several great artists composed new *ragas*. But even before that time the composing of new *ragas* must have occurred regularly. The above however has shown clearly how difficult it is for a *raga* to survive over a long time.

Variation in Schools disappearance; and environmental pressure.

In North-Indian classical music there are two styles which are considered the most important vocal styles: *Khayal* and *Dhrupad*. The *khayal* can probably be traced as a development from a particular variety of *dhrupad*, known as *dhamar* (cf. Desai 1970: 149-50, 169). Within each style there are a number of schools which follow different interpretations of the style. In *khayal* these schools are called *gharana*. Some *gharanas*, which are usually thought of as the oldest ones (Gwalior *gharana* for instance), sing the *khayal* in a way quite similar to the *dhrupad*.

The word *gharana* comes from *ghar*, meaning house, both in the literal and figurative sense. In the musical content *gharana* means a number of people who are musical descendants from one person and have a common style of which the principles have been laid down by the originator of the *gharana*. From the times of Tansen, the famous musician in the court of emperor Akbar (ca. 1600 A.D.) onward the concept of *vani* becomes important. In one of his famous compositions Tansen stressed *shuddh vani*, meaning purity of style. But it is only much later that the importance of *gharana* emerges, mainly in instrumental and *khayal* styles of vocal music. Each of the *gharanas* traces its descent to a legendary musician, often Tansen himself. The *gharanas* dispute each other's purity of descent. Deshpande has tried to show that the *gharanas* in *khayal* have evolved out of the *vanis* which were similar musical descents in *dhrupad*. His explanation is mainly musical. (1963: 1-11).

The exact content of the word *gharana* is very different for many people. Some stress the musical essence of style, others stress kinship. Although these are theoretically unrelated variables we may see them as a cluster, which centres around discipleship in complex form. Musical style of course is very much related to discipleship, and kinship may be related to it. Especially among Muslims this was strong until very recently: music was taught only to kinsmen in a consistent way. In a *gharana* a number of teacher-pupil relations are grouped into a social set. There is great variability in size of the *gharana*, as well as in various other characteristics, such as cohesion, age, relation to other *gharanas* etc.

In each *gharana* we can discern a core of great musicians, who claim to belong to this *gharana*, and who are thought by others to belong to it. Around them we can find a number of pupils (often descendants) and pupil's pupils. Sometimes artists claim to belong to a *gharana* without having had any lessons from an artist considered to belong to that *gharana*. The claimant simply imitates the musical style of the *gharana*. Then there are musicians who have learned most of their music in one *gharana* but do not consider themselves to belong to this *gharana*. Sometimes they branch off and found their own *gharana*, after having introduced a few innovations. Some artists have learned from several *gharanas* and have mixed the musical styles. They often appear as individual artists who refuse to be counted

among a *gharana*. Famous artists who come from the family of a *gharana* founder usually replenish the core of the *gharana*. Famous artists who are outsiders, but have learned from a great artist of a *gharana*, often strike off on their own. The core of the *gharana* then tries to maintain that this artist also belongs to their *gharana*. Unimportant artists who have learned from an artist of one of the *gharanas* may seek shelter in the fame of this *gharana*. An example may illustrate the above. The Agra *gharana* is a very important and big *gharana*. At the end of the 18th century it was founded by Shamrang Saresrang, who were in fact *dhrupad* singers of the Nauhar *vani*. As a *gharana* of *khayal* gradually took shape in the course of the 19th century, with the disciples, descendants, grand-disciples and grand-descendants of Shamrang: Ghagge Khuda Baksh, Sher Khan, Ghulam Abbas Khan and Kallan Khan, Natthan Khan was Sher Khan's only son. Natthan Khan was a very important artist of Agra *gharana* at the end of the 19th century. Faiyaz Khan was a grandson of Gulam Abbas Khan, who had learned most of his music from Sher Khan, his cousin. Faiyaz Khan learned from Ghulam Abbas Khan and also from Natthan Khan. Natthan Khan's son Vilayat Hussain Khan had many pupils, among whom was his son Yunus Hussain Khan. Vilayat Hussain Khan learned most of his music from his elder brother Mohammed Khan, who was Natthan's Khan's pupil. Natthan Khan also taught another outstanding figure in Indian music: Bhaskar Rao Bakhle. Bhaskar Rao Bakhle had learned from several other artists before he became a pupil of Natthan Khan. After having learned from Natthan Khan he entered into a peculiar relation with Alladiya Khan. The latter was a great exponent of Jaipur *gharana*. They are said to have had many discussions on the intricacies of *dhrupad*, *alop*, and so on, although we may safely assume that the major inbring was from Alladiya Khan. Bhaskar Rao Bakhle balanced the styles of Agra and Jaipur *gharanas*. He also introduced several aspects of music which he had acquired from his study of the *been*. He rejected the concept of *gharana*, and said that every musician should learn from several *gharanas*. Yet, many musicians from Agra *gharana* claim that Bhaskar Rao Bakhle really belongs to Agra *gharana*. Some of the weaker followers of Bhaskar Rao Bakhle say that they belong to Bakhle *gharana* (this is a clear case of seeking shelter — since Bhaskar Rao Bakhle rejected the concept). Dilip Chandra Veda learned *dhrupad* from Uttam Singh, a musician & musicologist of the beginning of this century. Then he learned from Bhaskar Rao Bakhle, Faiyaz Khan, and Alladiya Khan in that order. He considers Bhaskar Rao Bakhle as his true teacher whose style he prefers and like Bakhle himself, rejects the concept of *gharana*.

Another pupil of Bhaskar Rao is Kesar Bai Kerkar. Later on however she became a pupil of Alladiya Khan, and completely followed the latter's style. She learned for 26 years from him (Moghubai Khurdikar learned from Vilayat Hussain Khan, but more from Alladiya Khan, whose style she adopted. Apart from this, Vilayat Hussain Khan also learned a few things from Alladiya Khan (cf. Khan 1959: passim).

In the above example it becomes evident how complicated and fluctuating the structural relations between *gharanas* are. It is sometimes thought that Indian music, being a traditional art, is very constant and even stagnant, at least until the present. Here we have seen that not only have *gharanas* evolved over the last few centuries, but also it becomes clear how much fluctuation and variability are part of the system. Musical aspects from other *gharanas* may be adopted, but also musicians in the core of a *gharana* may change their music. Musicians who combine music of several *gharanas* may establish their own conception of music, and add something. Yet, on a general level, the concept of *gharana* is disappearing. Formerly *gharanas* could be identified, and they left an imprint on the artists that emerged from them. Thus the musical resemblance between Kesar Bai Kerkar and Moghubai Kurdikar is striking. Younger artists of the same *gharana* still maintain the strong characteristics of this *gharana* — of which Kishori Amonkar, the daughter of Moghubai Kurdikar is a good example. Contemporary artists from Agra *gharana*, Sharafat Hussain Khan or Yunus Hussain Khan show resemblance in style with great artists from this *gharana*. However, adoption of musical aspects from other *gharanas* is more frequent now-a-days. In the past an artist often had several teachers, but due to the strong power the teacher could exercise over the pupils there was usually one teacher who left the strongest imprint on the pupil. Today the relation is somewhat more open, and various teachers have about the same impact on a pupil. Moreover, due to the radio, public concerts, books, records, and a greater geographical mobility it has become much easier to assimilate musical aspects from other *gharanas*. Finally the emergence of an urban middle class, with the related emergence of an economically defined teacher-pupil relation has diminished the emotive quality of the relation. Emotionally it is easier now to leave one teacher and go to another.

On another level it would appear that among many young artists a new concept of music is emerging, on an all-India level (i.e. North India). First of all astounding technique (especially high speed) predominates as a value and to a large extent causes a diminished tunefulness. Rhythmic gimmicks and simplistic melodic progressions have gained importance. For all this little musical training is demanded, only a technical training, and the audience is more susceptible to this approach, since it is not conversant with the depth of the traditional idiom.

Evolutionary mechanisms

Any change will always have to begin with the artist. If he is confident about this change (consciously or unconsciously) he may introduce it to the wider environment, where it is either accepted or rejected. This process may be rather slow, as I suggested for the invention of new *ragas*. The audience at a concert may accept a new *raga*, but many competing artists will usually not accept it. However if the disciples accept it, in the long run it may become

part of Indian music in general. This is the point where we can say that it has been accepted by society at large.

Jairazbhoy suggests that Indian music evolves due to factors which are entirely musical, the inconsistency of scales (1971: 179). In the same way T.S. Kuhn implies an evolution in science which is the result of theoretical crises. The evolutionary vision Kuhn handles can be summarized with the following quotations:

"The process described . . . as the resolution of (scientific) revolutions is the *selection by conflict within the scientific community* of the fittest way to practice future science."

"The entire process may have occurred, as we now suppose biological evolution did, without benefit of a set goal, a permanently fixed truth, of which each stage in the development is a better exemplar.

"The net result . . . is a wonderfully adapted set of instruments we call modern scientific knowledge" (1962: 171-172) *my italics*).

Kuhn sees an important difference between science and art in the sense that science has unambiguous methods of selection which decide what is progress and what is not (1962: 159-163). This however is rather doubtful. In fact it would be true if we had "supreme knowledge". Because of the restricted nature of human knowledge time and again theories emerge which later on prove to be incorrect.

The theories of Kuhn and Jairazbhoy are in a sense evolutionary, but they do not really explain the mechanisms at work. They suggest that the process comes entirely from within. Jairazbhoy seems to believe that musical scales can develop out of other musical scales all by themselves. Kuhn is more careful — he profusely brings in the enactors of the evolution. But they act only when they should on behalf of scientific progress. In other words mutations occur only when they should with the "intention" to solve a crisis.

Devaraja's view, which includes artists, philosophers, and saints as well as scientists, is similar to Kuhn's when he says :

"The genius, thus, is seen to be the *spokesman of ignored or overlooked reality*" (1963: 127)

However he rejects the historical inevitability of the emergence of such geni to solve crises (1963: 133).

I would go further than Devaraja and suggest there are mutations and variations at all times. Every human being has a different perception of

reality and therefore has the potential to become a spokesman of an overlooked or ignored reality. Which of these perceptions come to be considered that of a genius depends on many circumstances. On the one hand there is the inherent quality of the perception, but on the other hand rivalries and the ethics of society play their role. In art I indicated the importance of rivalry and in science, in spite of certain ideals, we see often that vying thinkers criticize each other for the sake of it. And much of this rivalry is more based on personal antipathy than on scholarly disagreement.

It is rather obvious that variation exists in science both on the level of individuals and "schools". I wonder if any two scientists have an identical conception of such phenomena as culture, life or gravity....

Variation on this level can certainly be a source of new interpretations. Completely new theories of course are not easily understood. They depend on creativity which is quite unpredictable in nature. How, why and with what effect new ideas emerge in science or art is hard to say. But they are not coincidental. Artists most definitely, but in my opinion scientists as well, constantly try to improve and renew. Except perhaps the dull scientist or artist, who has given up the idea of bringing something new and prefers to stay under the umbrella of his "superior".

The host of new *ragas* which appear constantly in Indian music are an expression of the search for creation and invention. If both Jairazbhoy's and my theories are correct most of these creations will be discarded in the long run, through a process of selection. But even in the distant past the process of variation, mutation and selection may have played an important role. *Ragas* have been invented at all periods, but not all of them have persisted. In this a sudden change in the environment may have played an important role. Before Tansen there must have existed hundreds of *ragas*. This was probably possible due to the political separation of various states in India. When at the time of emperor Akbar many musicians were brought together at the royal court it became evident that many *ragas* were practically identical, but existed under different names in different provinces. Tansen realized this and discarded a great number of the *ragas*. Of the past century we know that many *ragas* have disappeared. They are so-called obsolete *ragas* which may also be lost when the old musicians who know them die. (e.g. ancient varieties of *Basant*, *Lalit* and *Purvi* with *shuddh dhaivat*).

Direction in Evolution

I have shown that the process of evolution in music must be understood in terms of certain evolutionary mechanisms. This (mechanistic) view in no way excludes a view which identifies the broad lines or direction in the evolution. These two views become particularly compatible if we make a distinction between general and specific evolution. Specific evolution is adaptive.

General evolution means greater adaptability. (Sahlins & Service 1960: 12-44). The concept of specific evolution is not too difficult to understand: it involves all types of adaptation to the environment. General evolution is a more complicated concept. I think Wertheim has given the clearest interpretation of this over-all development of mankind when he says that general evolution is a tendency towards emancipation. First of all there is an emancipation from the forces of nature, the development of the capacity not to adapt to different environments but to adapt the environment to oneself. Then there is the tendency to free man from the bonds of others, to diminish social inequality on all levels. (1971: 50-66).

Music, science and other aspects of culture are valuable to man. In this I strongly support Devaraja's view of culture as a value, i.e. a definition of the valuable or significant. (1963: 104-110). Ethnomusicologists have stressed the functional values of music, to mention a few: emotional expression, social safety valve, aesthetic enjoyment, communication, enforcement of norms, continuity of culture, integration of society (Merriam 1964) 209-229). Music can also play a role in catalysing a movement of emancipation. It can be symbolic for groups which strive towards emancipation or give general expression of a protest against oppression⁶ (Wertheim 1971: 147-152). On the other hand music may go contrary to emancipation. It may serve as an opium for the masses (cf. Wertheim: 1971: 409). I think that Indian film-music in its present state plays this role, although not intentionally.

However I think that the greatest value in music is in its innate qualities. Music can enrich and liberate the human mind. Science provides us with similar values, in addition to a concrete contribution which science has made to our conditions of living. This provides us also with a clue for the interpretation of progress in science and the arts. Both can provide man with means to enrich his life, and general evolution in science or the arts should be seen as an evolution which does contribute in such a way. All forms of adaptation of science or the arts to a social environment which do not contribute in such a way should be viewed as a specific evolution which can ultimately be disastrous. (A concomitant of science, industrial technology, might tend towards such specific evolution, in its indiscriminate adaptation to consumption society).

The degrees to which Indian classical music has succeeded in providing a possibility for the liberation of the mind is astounding. I can do no better than quote some masterly passages from Ananda K. Coomaraswamy:

"This Indian music ... reflects an emotion and an experience which are deeper and wider and older than the emotion or wisdom of any single individual. It is in the deepest sense of the words all-human. For it is the inner reality of things, rather than any transient or partial experience that the singer voices.

"We have here the sound of the tanbura which is heard before the song, and continues after it: that is the timeless Absolute, which as it was in the beginning, is now and ever shall be. On the other hand there is the song itself which is the variety of Nature, emerging from its source and returning at the close of its cycle. The harmony of that undivided Ground with its intricate pattern is the unity of Spirit and Matter.

"We are assured by the experience of aesthetic contemplation that Paradise is a reality" (1971: 96-99). That music has left the small compartments of the elite, is at large is a form of emancipation since a greater part of mankind can benefit from it. But the reaction to this change in environment in the form of simplifications is not a step forward at all, either for music or society. It must retain its powers of a profound impact on the mind and *convince* the audience, rather than please the audience. This we see as one of the main characteristics of general evolution: it implies greater adaptability by adapting the environment to itself.

Conclusion

The above shows how much Indian music is alive and evolving and although some may lament the changes at least one must be happy that this art has not become inflexible, almost frozen as is the case with western classical music.

In the course of the process something may be lost, but then it has been through gains and losses that Indian music has become what it is over the ages. Overspecialization can lead to extremes, such as the *dhruwad*, which at present often tends to monotony in repetitious rhythmical patterns. Confronted with a new audience, that is not conversant with the specialized idioms of the *dhruwad*, it has very little impact. Yet this style has immense possibilities and it will depend on the capacity of the musicians to bring it back into the mainstream of attractive melodious music. It is an illusion that the audiences can be educated by any other way than attractive music.

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NOTES

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2. It must be noted that I have been strongly inspired by Waddington. His approach is rather tentative, and I find no necessity in a detailed account of diversions of my views from his. In regards the biological model it must be noted that I do not concentrate on the statistics of populations, as is the case in modern biology, which studies evolution on the level of the species (Mayr 1963: 4-5).
3. Briefly summarized his theory looks as follows:

The scales or modes in Indian music are bicentric in character due to a drone which resounds the tonic and the fourth or fifth. If the scale is e.g. our major scale (known as Bilawal) with C as the tonic, the drone, produces the C and the G. Jairazbhoy suggests that the G may also function as secondary tonic. This is the source of the asymmetry. In the major scale the ascending line (*aroha*) shows a symmetrical pair of tetrachords: *c d e f : g a b c*. C is the tonic of the first tetrachord, G of the second. In the descending line (*avaroha*) the tonics remain the same, resulting in: *C' b a g : g f e d*. Hence whereas the ascending is a symmetrical progression of intervals ($1\ 1\frac{1}{2}$, $1\ 1\frac{1}{2}$) the descending is asymmetrical: $\frac{1}{2}\ 1\ 1 : 1\ \frac{1}{2}\ 1$. To resolve this the descending tetrachords must be changed. This can be done either by lowering b flat, or by raising the f to f sharp. In the first case the descending tetrachords get an interval division of $1\ \frac{1}{2} : 1\ \frac{1}{2}\ 1$ (KHAMAJ), in the second case $\frac{1}{2}\ 1\ 1 : \frac{1}{2}\ 1\ 1$ (YAMAN). In the newly obtained scales the ascending tetrachords are asymmetrical. In similar vein we can go on to derive a vast number of scales through various ingenious manipulations. Whether this theory has much relevance in musical reality I shall not discuss here.

4. This *Raga* is called VEDI KI LALIT. It uses the following note — patterns (c is tonic): c, d, e-flat, g,e; e,g,a, b-flat, a,g,e,e-flat,d, de,e,g,a,c'; c', b-flat, a, g,e,g, e-flat, d,c,d,e-flat, e,c — Lalit, a *Raga* with f and f-sharp, is a modulation of *Todi*. So is VEDI KI LALIT a modulation of *Purya Kalyan* and has two e's. VEDI calls it the "answer" to *Lalit*.
5. As stated above it is a modulation. This however is irrelevant as many *Ragas* are modulations of other *Ragas*.
6. Jazz, blues, spirituals are partly symbolic of a negro-cult with obvious emancipatory implications. Similarly "beat-music" has an important function in the youth-cult. Wertheim considers emancipation of young people an important aspect of general emancipation (1971: 57-58).

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