The necessity of and problems with a universal musicology

Abstract
The search for universals is no longer linked to the old belief that tonality is based on the laws of resonance and, as such, is more natural than any other system. Despite a period of excessive cultural relativism, the search for musical universals now seeks to understand on which bases different musical cultures can communicate and interact. Some universal features are restricted to human music: pentatonic polyphony on a drone, and isochronous ostinato, for example. For these, lack of evidence for historical diffusion leads us to suppose that they come from spontaneous universal genotypes. Furthermore, comparing music with animal sound organization gives still more convincing data to support the hypothesis of some basic innate schemes. In some animal species, rhythms and melodies exhibit several of the traits considered as typically musical. The existence of an aesthetic dimension in their use of sound signals might be referred to as a kind of hypertelia, the primary goals of nature (mating, defending a territory, etc.) being exceeded, so to speak. Artistic creation appears as invention with, and beyond, the commonplaces suggested by nature.

One could say that the purpose of this chapter is to analyze some consequences of a single machine in the field of music and musicology. From the middle of this century, the taperecorder has deeply modified the way that we think about music. Without the taperecorder, which allows us to hear and compare music from all over the world, we would perhaps have missed the fact that the tonal system can no longer be considered to be universal, since among so many different systems it proves to be completely irrelevant. We would also have much poorer knowledge of animal sound signals, since we would be forced to rely on our memory to compare them. The time of the emancipation of Asia, Africa, and so on has also been the time of the taperecorder. One century after Debussy, it helped a much wider audience to realize that we had no right to define their music as primitive just because most of them were lacking some dimensions or rules of ours. Eventually the taperecorder also had a tremendous impact on the musical industry, one of the most powerful - and problematic - phenomena of our time.

-But the diversity among musical traditions is greater than the diversity of the basic schemes they use. If ethnomusicology has underlined, since 1950, the great amount of cultural diversity in musical traditions, it might now be useful to reconsider what all cultures have in common, and to understand why they are so easily and so widely prone to imitate each other and to yield to worldwide uniformity. Let us briefly look back at the first half of the twentieth century. When Curt Sachs published his *Geist und Werden der Musikinstrumente* (1929), very few people suspected that such basic notions as scales, key notes, bars, melody, and harmony, and tones as opposed to noises could sometimes prove irrelevant when applied to non-Western cultures. Bartók was among the first to realize how improper our notation was in some of those contexts, and Varèse met very little understanding when he tried to create his music on other, newer foundations.

It has been taught since Pythagoras, and it is still believed by some, that heptatonic 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 three pillars of the tonal temple, corresponds but vaguely to the eleventh overtone (minus a quarter-tone) or to the twenty-first overtone (minus twenty-nine cents). Anyhow, nobody has ever heard such high overtones, which represent sounds alien even to the chromatic scale, since starting from the seventh overtone many pitches do not coincide at all with it. 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 musical cultures.

Things changed after 1948 (the year of the taperecorder) and 1955 (the year of Bandung, when twenty-four former colonial countries defined a new international order). Ethnomusicology developed as a new approach to the music of the world, and pointed out that even the phenomenon of music itself could be properly understood only if considered from the inside; that is, from the point of view of the cultural system in which it appeared (in which even the concept of music might have a different definition than in Western societies, or not be defined at all). The result was that scholars tried to forget about any theory or category that might distort their appraisal of the music they tried to describe.

It would certainly be a caricature to characterize the comparative musicology of the 1920s and 1930s as a naive expression of cultural colonialism, and ethnomusicology as a point of the great illusion of a world revolution. But in some cases, such political considerations underlay the scientific approaches, at least until today, when it seems that everything has to be reconsidered. New ethnomusicologists born in Africa or Asia study their own culture from the inside, but they use a cosmopolitan technology to do it, and they are trained in no less cosmopolitan methods. Extreme cultural relativism, through its excessive focus on the specificity of every musical culture, tends to present the common aspects as pure misunderstanding. It claims that no culture has any right to superimpose its categories on any other. Doing so, it tends to favor a kind of reverse racism by-isolating every culture from all others, while the ubiquitous blending of musical practice becomes unintelligible.

Another fact favoring the search for universals in music is the quick vanishing of traditional music, everywhere replaced by the professional model that the music industry has promoted and imposed: specialization of composers, interpreters, and listeners; musical works treated as commodities; and so on. Many practices testifying to the cultural diversity I referred to are no longer available outside the archives where our taperecorders have allowed us to freeze their images. We have to understand how and why cross-cultural features are met with everywhere in music, even if no universal definition of what music is has yet been agreed upon.

Instead of proposing my own theoretical definition, I submit a series of sampled universal features that, to my ears, oblige us to inquire into their real nature. The first one is limited to humans, but encompasses the whole world. It can be defined as pentatonic polyphony on a drone. Such polyphony can be found in such diverse musical sources as: the music of the Nung An minority of Vietnam; the *Gerewol* song of the Peuls Bororo of Niger; music of the Paiwan aborigines of Taiwan; folk songs from Albania; Sena choir songs from Nagaland, India; and *Dondi'* (sitting funerary choir music) from Sulawesi, Indonesia.

Meeting such obvious similarities, an ethnomusicologist will often try to discover along which tracks they must have been circulating and trace them back to one common source. In my opinion it is quite unlikely that any relationship can be proved during historical times between Taiwan and Niger, or between Albania and Sulawesi. If we imagine that such likeness may refer not to historic relationships but to the supposedly common origins of humans, it seems that the two types of explanations differ little (through diffusion or through spontaneous similarities) between cultural history or natural innate schemes. Because if such close similarities, in music just as in mythology, are the only surviving tokens of an ancient diffusion, the question is, why have only these features seemed to survive? what was so important about them that they were not transformed after thousands of years? On the other hand, if they are not the result of forgotten migrations but of a natural scheme, problems related to geography and history no longer exist, and thousands of years count for nothing in evolutionary terms. The main problem is to understand how precise sound organizations can be inscribed in every brain, and how musical choices emerge from them or deal with them. I leave it to psychologists and neurophysiologists to explain the muscular and neural laws that help us understand the ubiquity of certain tempos and rhythms in animal vocalizations and human music.

To support my hypothesis of universals given by nature in music, I will illustrate several similarities between animal and human signals (see Mâche, F.-B. 1992, especially the chapter entitled "Zoomusicology"). I must first justify this approach. Culturalists claim that one may not apply the same categories to different cultures, and even that the definition of what is the same is always a matter of cultural relativity. In the same manner, some psychologists claim that it would be anthropocentric, and therefore wrong, to assimilate or even to compare animal and human sound features. In both cases a predefined category such as "music" or "culture" is raised against the observation of likeness. They are characterized as pure convergences. By using this term, one refers to likenesses that, strong as they may seem, have no explanatory value, because they refer to separate causal series. The thumb of the panda is no thumb; the whale's fins do not make it a fish. The question is, can acoustic features that are common to animals and humans be viewed as simple convergences, with no scientific value because they contradict many other differences? The question of universals in music is directly related to the question of its origins. Being a musician rather than a biologist, I tend to observe surface structures, musical features. I try to distinguish what is universally encountered among them. If they correspond to concepts provided by evolutionary theories, one can state that the universal and the biological coincide.

To propose an answer, I submit a number of examples taken from several animals, illustrating categories that are considered typically musical. I use the terms phenotypes and genotypes to designate, on the one

hand, acoustic forms -surface structures- and, on the other hand, dynamic schemes that determine their appearance, at least partly. I borrow both terms from biologists, with a slightly different interpretation if musical genotypes should turn out to be less constraining than their counterparts in biology.

In my career as a composer I was interested in phenotypes long before I undertook to connect them with possible genotypes. It is only after long acquaintance with animal models, which I have used in many works since the beginning of my career in 1958, that I wondered why I could so willingly perceive some latent music in the sounds made by whales, frogs, crickets, and birds. Eventually I perceived the correctness of the mythic tradition that presents music as related to bird song. What is new about this antique intuition is the taperecorder, which allows us to compare and to verify.

The objection that bird song is only the expression of biological functions, like territorial defense or courting, and belongs to the semiotic sphere, not to the aesthetic, is not as weighty as it seems. I mention it now to indicate that it did not prevent me from looking for a natural justification for my use of natural models.

An important family of rhythms among the different musical systems is the *aksak,* which exist in a very large area corresponding to the empire of Alexander the Great, from the Balkans to the Pamirs. They oppose an irregular number of basic units, very often grouped by three and by two. This seems to exist also in some animal species. Examples are seen in the songs of *Tockus erythrorhynchus,* the red-billed hornbill, and *Alectoris tufa,* the red-legged partridge. Sometimes, a song is rhythmically organized as a whole. This means that the bird may have an overview of a very long duration. For example, in this song by *Turtur brehmeri,* a blue-headed dove, the first two notes of the accelerando are separated by 2.2 seconds, and one realizes only after having heard them that they are starting a long accelerando, whereas in the song of *Sarothrura lugens,* the chestnut-headed pygmy rail, the universal link among accelerando, crescendo, and rising in pitch, is clearly present.

What is most universally considered as musical is the occurrence of a set of discrete pitches. Speech or "noise" shows no fixed pitches, whereas music is claimed to begin with the invention of a scale (even if *Ionisation* by Varese and rap music do not make use of it). Many mythic traditions, in Greece and China, for example, attribute this essential creation to a god or a cultural hero. In fact, many animals use precise and stable sets of pitches in their signals. *Halcyon badius,* the chocolate-backed kingfisher, moves up and down along his own scale, characterized by very small intervals. More subtly, *Cossypha cyanocampter,* the blue-shouldered robin-chat, is not satisfied with enumerating the tones of its scale, but operates on it by building melodic motives as elaborate as many human achievements, and even sounding so close to them that one might be mistaken. The same melodic use of a scale, but in this case a kind of chromatic scale, occurs in *Erythropygia leucosticta,* the northern bearded illadopsis. Sometimes, articulatory variations are added to the pitch variations. In the example of *Trichastoma albipectus,* the scaly-breasted illadopsis from Kenya, you get a legato instead of a previous staccato.

Still closer to human organization is the evidence for a hierarchy between the degrees of a scale. A note may assume a particular role, according to its frequency and position in the melody. This is true for human systems, such as the tonic and dominant in tonal systems, or the *shâhed* or *forud* in Iranian *dastgâh*. It is also true for some animals. In the songs of *Erythropygia leucophrys,* the white-browed scrub robin, a kind of keynote appears at the end of each stanza. Even intervals as large as those found in Schoenberg's songs can be heard, as in the songs of *Cyphorhinus arada,* the musician wren.

The process of transposition is of particular relevance for a comparison between animals and humans. It implies memory for and consciousness of a given sound pattern treated as a whole. This can be shown in the song *of Hylobates lar,* the white-handed gibbon. Whenever a sound model is imitated by a bird whose range does not fit, it is transposed both in pitch and duration, as for example when *Lanius minor,* the lesser grey shrike, imitates a rooster.

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, which can be summarized this way: animal sound signals belong to pure semiotics. There is nothing gratuitous about them. Every aspect must have an evolutionary utility.

My answer is first that the idea of a gratuitous aesthetic pleasure is but a very small part of musical

behavior 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. It is quite a naive idea to consider music only as the thing a young lady does when performing a piece on her piano, with friends and family attending. Many cultures make music only in ritual contexts. The Toradjas of Sulawesi never make music for the sole pleasure of singing or listening; they have no lullabies, no wedding songs, no dirges. They sing only in large polyphonic choirs during ceremonies. It would be bold to say that they have no music simply because this activity figures in social occasions where singing is just part of the whole.

Second, social singing between neighboring males of a given species, or even of different species, has been repeatedly reported; for example, *Acrocephalus palustris,* the marsh warbler, and *Trichastoma moloneyanum,* Moloney's illadopsis. No definitive biological advantage can explain this behavior. It is not proved that such singing neighbors avoid territorial conflicts more easily than those that sing alone or ignore each other. With regard to autumnal singing, its utility is not clear either.

I would rather suggest that the opinion maintained by several biologists such as Thorpe (1966) is right: there is also something like an intrinsic pleasure in singing. The luxurious display of some of the best singers suggests that they go far beyond the signals that would be necessary for keeping a territory or mating. Could we interpret birdsong, and consequently music, as a case of hypertelia? The views that the ethologist Sebeok (1975) expressed seem to support such a hypothesis, 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. Diversity in song may at first have allowed an individual to prevail over a competitor, before gradually overshooting the mark. In that case the excess would have turned not into a disadvantage but an unexpected pleasure.

Of course viewing culture as something which originates in a natural function, and imagining that it turned out to bring a new end beyond pure survival, may look heretical both to a large majority of biologists and to many musicians as well. I leave my conclusion to the taperecorder. I can only say, as a composer, that *Craticus nigrogularis,* the pied butcher bird, is a kind of colleague.

References

Mache, E-B. (1992). *Music, Myth and Nature: Or the Dolphins of Orion*. Chur, Switzerland: Harwood Academic Publishers.

Sachs, C. (1929). *Geist und Werden der Musikinstrumente*. Berlin: Reimer.

Sebeok, T. A. (1975). *Zoosemiotics: At the Intersection of Nature and Culture*. Lisse, The Netherlands: de Ridder.

Thorpe. W. H. (1966). Ritualization in ontogeny. *Philosophical Transactions of the Royal Society of London. Series B* 251:311-319 and 351-358.

The origins of music, edited by Nils L.Wallin , Björn Merker, and Steven Brown, The MIT press, Cambridge, Mass. , London, England (2000) p.473-479