

Four Issues in the Study of Music in Evolution

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Abstract

This paper responds to articles published in the world of music 48, no. 2 (2006) on the topic of music's emergence and spread around the world, addressing four issues raised there. First, the notion that musical style has the capacity to be conserved and transmitted over very long time-scales is assessed. It is suggested that there is a little direct support for this in the archaeological record, but only from a cultural environment quite distinct from that inhabited by the ancestors of today's Pygmies and Bushmen. Second, attention is given to the extent to which theories concerning the details of cultural process can be securely tied to the detailed scientific literature on human evolution. This is a quickly changing field, both in terms of genetic testing techniques and in terms of scientific interpretations: it may be premature to propose detailed interpretations of something as complex as musical practices at this stage. The notion that stasis appears as a norm in cultural process is the third issue examined, in the light of emerging research on cultural modelling in relation to evolution, which suggests that stasis is by no means automatic or inevitable. Finally, the response proposes that we understand "music" as a means of managing social uncertainty. If so, then the recurrence of musical features from one society to another may not show historical linkage but rather the persistence, or the continual re-emergence, of particular patterns in social interaction.

1. Introduction

Victor Grauer's article (2006a), and the responses to it by Bruno Nettl (2006), Jonathan Stock (2006) and Peter Cooke (2006), raise many fascinating points. In this response I want briefly to address four of the issues raised in the course of this stimulating exchange of views: the notion of musical style as having the capacity to be conserved and transmitted over very long time-scales; the extent to which theories concerning the details of cultural process can be securely tied to the detailed scientific literature on human evolution; the notion that stasis appears as a norm in cultural process; and the question of how we might attempt to define what we mean by "music".

2. Musical Style and Time-depth

Perhaps the most intriguing, and controversial, point in the debate is Grauer's proposal that musical styles may have time-depths that are quite beyond anything that musicologists are ever likely to have conceived. Grauer suggests that elements of a musical style can be identified as common to two different African groups, Pygmy and Bushman—henceforth, as Grauer puts it, "P/B style" (2006a:13). These two groups are geographically and culturally disjunct, and the likelihood that the musical style has migrated from one to the other in historical times is, for Grauer, very low (though Cooke questions this on p. 99 of his response). Moreover, these two groups are identified by Grauer as prospectively representative of the "original inhabitants of Africa" (2006a:9), and hence as representative of the aboriginal populations from which arose modern humans in a pair of dispersals from Africa, around 80 kya (thousand years ago) and 60 kya; he suggests that the commonality of

musical style represents a common musical heritage that has persisted over a time-depth of perhaps 50 ky, and that is perhaps the “aboriginal” human music. Grauer proceeds to suggest that aspects of the style—in particular, antiphonal practices such as hocketing—are found amongst other peoples whom he identifies (after Oppenheimer 2004:156) as “aboriginal peoples who may be descended locally from those first beachcombers”; hence, he suggests, their use of such a style may also reflect aboriginal musical P/B musical practices.

Irrespective of whether or not the Pygmy and Bushman musical styles are so similar that they can be regarded as identical (a view itself contested, as Grauer himself notes, by Susanne Fürniss and Emmanuelle Olivier), the notion of musical styles as having long time-depths is one that appears novel (indeed, as Grauer suggests, mind-boggling). Nevertheless, there are good archaeological grounds for supposing that aspects of “cultural style” may persist over exceptionally long time-scales; for example, the manufacture of handaxes by the Levallois technique, a complex process requiring great technical skill and a “feel” for lithic materials, persisted in the same way for tens of thousands of years. Such cultural conservatism, it has been argued (Mithen 1996), is characteristic of the *predecessors* of modern humans; the modern human presence in the archaeological record is marked by a high rate of change in the cultural artefacts deposited. Nevertheless, modern humans—*Homo sapiens*—could at times exhibit a disconcerting conservatism in their cultural productions, particularly in respect of musical artefacts ; there is some archaeological evidence that might support the idea that musical styles can persist over periods longer than the life of any known civilization, though on a different continent from that to which Grauer ties his argument.

In a remarkable review article, D'Errico *et al.* (2003) provide an evaluative overview of the material evidence in the archaeological record that bears on the emergence of language, symbolism and music. They survey the earliest known unambiguously musical instruments, amongst which are several assemblages of bird-bone pipes from Isturitz in southern France. It is here that the existence of probably the longest-lasting musical tradition in prehistoric or historic times can be imputed to the peoples who produced and used these bird-bone pipes. As D'Errico *et al.* (2003:45) note, pipes from Isturitz from the Aurignacian (around 30 kya) and Gravettian (from ca 27 kya to ca. 20 kya) display similarities that suggest "a surprising agreement of purpose". The pipes are all of markedly similar construction, not only in making use of the same materials (vulture ulnae), but also in the shaping and layout of their finger-holes. On the basis of this evidence, the notion that aspects of a musical tradition might remain stable over periods of as much as ten thousand years is certainly not unfeasible. However, this tradition appears to have persisted in a thinly-peopled region where there is likely to have been virtually no interaction with peoples of significantly different cultural traditions and values; the hunter-gatherer cultural landscape of Europe between 20 and 30 kya appears fairly uniform, with few major cultural changes. Hence scope for the persistence of traditions in domains of behaviour such as music appears likely to have been much greater than that which may have been attainable by the ancestors of the present-day Pygmies and Bushmen, inhabiting as they did a much more densely-peopled and environmentally diverse continent.

3. Human Evolution—Known Unknowns

The study of human evolution is a dramatically and dynamically changing field. Many of the claims proposed by Oppenheimer (see Grauer 2006a:16) seem to be called into question by more recent published work (for example, Mellars 2006). In particular, the notion that significant populations of modern humans are present in Southeast Asia before the Mount Toba eruption (74 kya) and continue to inhabit particular areas (in Oppenheimer's account, coastal regions in Southeast and East Asia) as "relict groups" (Grauer 2006a:40) is controversial, to say the least; as Mellars (2006:797) puts it, "claims for the presence of behaviorally modern populations in Malaysia before the Mount Toba (Sumatra) volcanic 'supereruption' around 74 kya have yet to receive any clear support from recent archaeological research in the region". The question of whether there was a single dispersal or multiple dispersals of behaviourally modern humans from Africa seems to be settling down on the single dispersal hypothesis; again, to quote Mellars (*ibid.*:797), "recent studies suggest that the whole of modern Asian and European populations derive from one small subset of the so-called L3 mitochondrial lineage in Africa".

Hence at least some of the bases for Grauer's proposals would appear to be called into question by current genetic and archaeological interpretations. Nevertheless, much remains unknown; there is a paucity of archaeological data from Arabia and India in the period 50-60 kya (see Grauer's acknowledgement on p. 26 of his article of a "huge gap between the Horn of Africa and Southeast Asia" in respect of evidence for musical hocketing or interlock), and the pace of development of new genetic testing techniques over the last few years only makes clear that we do not yet know

the powers and limits of data at the genetic level for a full understanding of human evolution. Given our present state of knowledge, it appears possible that the situation may well swing back in favour of Grauer's suggestions. But I would suggest that it is unwise to bind interpretations of the relationships between complex behaviours within different societies to a such a labile field as the present-day understanding of the archaeo-genetics of human dispersal

4. The Archaeological and Evolutionary Dynamics of Cultural Change

One of the foundational notions upon which Grauer's argument relies, the idea that that culture does not change except in response to external imperatives (2006a:12) has to be evaluated in the context of research on the relationships between culture and evolution (see, for example, Shennan 2002, 2007). Such research has grown in sophistication and significance in recent years (in part because of the increased utility of computational modelling), and has been shown to have considerable explanatory power in respect of the interpretation of archaeological findings. In effect, this strand of research has shown that at least some cultural factors appear to be susceptible to explanation in terms of evolutionary processes. Note that this is *not* a return to some sort of "cultural progressivism", simply an application of evolutionary theory and principles to the understanding of how societies and cultures relate, and come to relate, more or less well to their environments in terms of evidence for their persistence in the archaeological record and in terms of evidence of the changes that are displayed in that record. The impact on cultural longevity and stability of various factors (including ecological and organisational) has been explored.

These approaches to cultural modelling appear to have potential to explore at least some of the issues raised by Grauer's thesis, including the extent to which forms of social behaviour can, or are likely to, persist over time, and the extent to which different aspects of a society's cultural and genetic make-up are likely to exhibit degrees of correlation or decoupling over time. For example, should one expect a tight coupling between genetic and linguistic diversity in exploring relationships between societies?—a recent study by Jean-Marie Hombert (2006) suggests that such a tight coupling is by no means inevitable. Might one expect that language and generic musical style would change at similar rates, if at all? At present, asking such a question would be premature; music—indeed, more or less any activity that can be thought of as primarily artistic or ritual in import—has barely figured in cultural modelling to date. It will be necessary to factor music into such models before we are in a position to make predictive and testable claims about the ways in which societies and cultures, and the elements of these, may change.

5. What Do We Mean by “Music”?

As a final point, I wish to pick up the question identified by Bruno Nettl (2006:60) as raised by Grauer in section 2 of his opening paper, and re-addressed by Grauer in his further response (2006b:102): is there such a thing as music? Grauer seeks to answer Nettl's question by reference to Saussure's account of language as “a system of interdependent terms in which the value of each term results solely from the simultaneous presence of the others”, suggesting that the definition can also be conceived of as holding in respect of

music. I feel that reliance on Saussure does not take us far enough; Saussure's definition is predicated on the arbitrariness of the sign, and indeed may be better conceived of as a means of identifying semiotic systems *per se*. Within its bounds, language and music appear identical, and music appears discretely identifiable by Grauer only by recourse to other criteria, such as the observed existence of "tonal/rhythmic fields".

From an evolutionary perspective, almost everything remains unknown about music. One fact we do know is that something like music was highly important for the earliest modern humans to reach Europe around 40 kya. The evidence for this exists in the form of the bird-bone pipe found at Geissenklösterle in southern Germany, dated to 36-38 kya. Although it might be argued that this bird-bone pipe may have had some sort of signalling rather than musical use, it is absurdly over-engineered for that purpose; it has several carefully shaped and spaced finger-holes, as, indeed, does the extraordinary mammoth tusk pipe found in a nearby location and dated to around 35 kya. These are highly unlikely to have been the *first* manifestations of musicality in modern humans. As D'Errico *et al.* 2003, point out, they are far too sophisticated, possessing many features characteristic of historic wind instruments; their sophistication strongly suggests that modern humans brought musicality with them out of Africa. Musicality, from the archaeological evidence, is most likely a modern human capacity with considerable time-depth.

Yet we know nothing of the structure of early human music—how it was fashioned, and how it sounded. We might, however, be able to conjecture what it could have been *for*, by extrapolating from apparent commonalities in

the uses of music across contemporary world cultures, and in that way begin to differentiate musicality as a universal human capacity from other domains of human thought and behaviour. In a number of publications (for example, Cross 2005, 2007, forthc.) I have suggested that music, as a universal and interactive human behavioural capacity, might best be interpreted as a communicative medium adapted for the efficacious management of social relations, particularly in situations of social uncertainty. Such situations could include, but not be limited to: significant life transitions for individuals, and for individuals as part of a wider community (such as adolescence to adulthood, childhood to adolescence, life to death); the formation of individual, and collective, within-group identity; circumstances where the integrity or stability of a community is perceived to be threatened or is felt to require re-affirmation; the affirmation—or even encouragement—of propitious relationships between the social order and that which sustains it (for example, the natural environment construed as an agentive and hence prospectively social force); the management of inter-group relationships (by, for instance, constituting a mutually accessible framework for non-conflictual between-group interactions, or serving as a mechanism for consolidating within-group bonds so as to enhance the likelihood of success in inter-group encounters). And of course, musicality, or proto-musicality plays crucial roles in negotiating the hazards and uncertainties of perhaps the most universal of human experiences, that of caregiver-infant interaction (see Trevarthen 1999/2000), where language is simply inefficacious.

In these caregiver-infant interactions, language and music are ontogenetically intertwined (see, for instance, Papousek 1996); it is difficult to partial out the correlates of early language development from those of early

musical development. It seems likely to be the emergence of referential function (see, for example, Eilan *et al.* 2005) that differentiates the linguistic from the musical faculty in the course of a child's development; but, of course, the specific features of the musicality that may be exhibited as the child matures will depend on the ways in which "musicality" is valorised and structured within the child's society. And it can be argued that it is differences in explicit referential potential that differentiate music and language as mature behaviours and communicative modes. While language self-evidently can also play a significant role in managing situations of social uncertainty, in many respects a communicative medium that lacks language's semantic specificity—or better, possesses the attribute of "floating intentionality" or semantic indeterminacy—is better suited to the management of social uncertainty than is language, with its capacity for unambiguous meaning and hence assertion of conflicting viewpoints of the dynamics of socially uncertain situations. Accordingly, I prefer to approach the question "is there such a thing as music" by expanding it, as Grauer implicitly does, to ask "is there such a thing as music in the sense that there appears to be such a thing as language?"

However, I adopt a pragmatic rather than a structural perspective in seeking to answer this question (while acknowledging, as Grauer does, that structural issues must still be adequately addressed). We certainly appear able to claim that there is such a thing as language on the basis of evidence for the universality in all known human societies of a medium for interaction that involves vocal—and gestural—products and percepts which can be interpreted as making explicit, complex, yet unambiguous, reference to states of affairs in the physical and social world and hence influencing—and

predictively co-ordinating—individual and joint action. In other words, evidence for the universal human existence of language takes the form of observations (a) of particular and universal modes of human interaction, and (b) of the efficacy in human behaviour and society of such modes of interaction.

It seems difficult to make claims for the existence of music as a universal human behaviour on grounds that are as manifest and principled as appear to exist for language. However, I would suggest that the humanly universal existence of a class of interactive behaviours that (a) appears to have efficacy in a range of social contexts that are characterisable by a degree of *uncertainty*; (b) that involves vocal, instrumental and gestural products and percepts; (c) that is oriented around a commonly-experienced pulse (which may or may not be overtly present at the level of the sonic surface); (d) and that is semantically indeterminate, could form the basis for the identification of a thing we might call “music”. The semantic indeterminacy of music, combined with its capacity to entrain participants to a commonly-experienced regular pulse, endows it with a power to sustain social interactions even when the interpretations and feelings of participants in respect of the purposes and significances of their activities may actually be conflictual. Considered in this way, music can be regarded as a highly adaptive communicative medium, co-extensive with, and complementary to, language, differing primarily in occupying the opposite pole on a continuum of specificity of meaning from that which language has the potential to occupy. Such a useful means of co-ordinating and managing social interaction—useful in the sense of having an evident functionality within present-day societies—

can be interpreted as having been likely to have been equally useful in the course of human evolution.

To return to Grauer's thesis, from the perspective of this approach to defining "music" it can be argued that constraints on modes of interactions with others might be thought of as playing a role in motivating the use of particular musical features and styles that betray some similarities. Hence the recurrence of features that characterise the "P/B style" may not be historically linked, but rather may be contingent on either the persistence, or the continual re-emergence, of particular patterns in social interaction. If music is considered as a means of managing social uncertainty, and if particular modes of musical interaction—such as hocketing—prove efficacious in managing particular types of circumstantial uncertainties within particular types of social organisations (perhaps tending to favour more-or-less flat inter-personal structures), then the occurrence of music exhibiting such styles may be attributable to a process of repeated convergence on particular musical solutions to particular social situations rather than being identifiable with any common genetic descent. This is *not* to argue that particular societies conform to fixed and immutable types of social organisation; any society is likely to call into existence social structures that vary according to environmental and social circumstance, and it may be that in respect of these constrained circumstances particular modes of musical interaction have particular social efficacies. In other words, rather than postulating that a particular type of music is characteristic of a particular society, it is perhaps more helpful to clarify the extent to which a particular style of music is manifested *in particular circumstances* within a particular society and to assess the commonalities, in terms of social dynamics, of such circumstances across

cultures. At the end of his original article (2006a:45), Grauer raises the intriguing question of the correlative persistence of social structure and musical style. However, I am more tantalised than reassured by Grauer's concluding answer that "musical style may not reflect social structure so much as cultural value" (*ibid.*:46). This seems to me to be more properly a starting point rather than a conclusion, raising many more (stimulating) questions than it answers.

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