Music in Human Experience

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Perspectives on a Musical Species

Edited by

Jonathan L. Friedmann

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INTRODUCTION

Since the mid-twentieth century, musical research has increasingly focused on "why, and how, human beings are musical" (Rice 2014, 1). Investigations into musical experiences—in all their social, cultural, material, cognitive, biological, and artistic diversity—have highlighted music's vital role in communication, emotional expression, symbolic representation, physical stimulation, social integration, cultural preservation, validation of institutions, aesthetic enjoyment, and more (Merriam 1964). Findings from the social sciences, humanities, and biological sciences have inspired bold affirmations: "music is a human need" (Mead 1972); "the musical brain created human nature" (Levitin 2008); "we need music to be fully human" (Rice 2014, 1); "music [is] a language of humanization" (Banfield 2015, 18).

Supporting these observations are numerous interdisciplinary studies, such as those collected in this volume. Viewing music as an activity linked to other aspects of culture, they seek to understand the origins and evolutionary functions of music-making; the cultural meanings, associations, and uses of song; the development of group-specific musical conventions; the emotional and behavioral expectations associated with certain sounds; and so on. In different and novel ways, the chapters in this book build on and revise foundational insights accumulated over the years. For example, the claim that music, like language, is a species-specific trait of humanity (Blacking 2000, 7). The recognition that we inhabit "soundscapes" and "music-cultures" (Shelemay 2000; Titon et al. 2005). The observation that music is a means through which people mark identity and place, and the boundaries that separate them from others (Stokes 1997). An appreciation of the role of the listener—and the listening context—in determining music's aesthetic value (Chion 2006). The realization that all music is hybrid (Gustafson 2020, 10) and that "folk music" is not a fossilized corpus of timeless tunes, but the record of a lived experience that changes over time (Slobin 2011, 2-3). The argument that, despite the dizzying array of culturally, geographically, and temporally specific sounds, there are certain structural, functional, and material universals of music across human societies (Brown and Jordania 2011). An emerging awareness that, while music as we know it may be specifically human, some of the mechanisms that underlie human musicality are shared with other non-human species (Honing 2018).

These revelations are representative of new directions of musical research. Yet, as Bruno Nettl, the late pioneer of the field of ethnomusicology, asks in the lead chapter of this volume: Can these be considered "great discoveries"? Put differently, can these abundant, nuanced, wide-ranging, and interdisciplinary studies be mined for general principles? Nettl's own eight-fold answer provides a useful framework for the chapters ahead: (1) world music is really world "musics"; (2) conceptions of music differ across time and cultures; (3) music-cultures encompass music as sound, ideas about music, and behaviors surrounding music; (4) musical creation is a continuum involving improvisation and composition; (5) music involves interactions of cultures, genres, repertories, styles, and musicians; (6) musical style is informed by natural, cultural, intercultural, technological, and biological factors; (7) ethnomusicology has practical applications, such as conflict resolution, cultural preservation, combating ethnocentrism, and furthering social justice; (8) studies in ethnomusicology—and related areas of musical inquiry—correct earlier paradigms of musical thought linked to a single (European) culture.

Rather than organizing the chapters into tidy subdivisions, this book acknowledges the eclectic, multifaceted, and interactive nature of the subject matter. Smaller sections would have stifled this cumulative effect, interrupting the organic dialogue between chapters and artificially reducing both the authors' intentions and the readers' expectations. The chapters are instead arranged to flow one into the next, building a collective argument for the centrality and complexity of human musical expression. It is my hope that, despite the creativity and eclectic nature of the ideas herein, their multilateral character and common themes will ring out.

Following Nettl's chapter is one by John Collins, lecturer in the music department of the University of Ghana and chair of the Bokoor African Popular Music Archives Foundation. Collins draws on evolutionary theory, primatology, archaeology, adult-infant communication studies, musico-linguistics, comparative linguistics, and ethnomusicology to show that early hominins were musical creatures. As such, he argues, music was an aspect of the non-symbolic vocal-gestural communication of the first small-brained hominins and also of the non-grammatical—but nevertheless symbolic—musico-gestural languages of the larger-brained Homo genus that followed.

Alejandra Wah, assistant professor of arts and cognition at the University of Groningen, the Netherlands, draws on evolutionary musicology, cognitive archaeology, and developmental studies to explore direct and indirect

evidence of the emergence of the cognitive capacity to experience preverbal and nonverbal narratives by means of music, song, and dance.

Victor Grauer, a Pennsylvania-based composer, musicologist, filmmaker, media artist, poet, and dramatist, examines evidence pertaining to the distribution of so-called "Pygmy-Bushmen" musical style in light of the "Out of Africa" model, and how certain features of this style suggest fascinating possibilities with respect to the origins of both music and language.

Simha Arom, emeritus research director of the Centre National de la Recherche Scientifique, Paris, emphasizes the fact that, like language, traditional music is a symbolic production transmitted orally from generation to generation. These musical idioms mostly have no explicit theory, although their users are fully aware of what is correct and what is not.

Piotr Podlipniak, professor at the Institute of Musicology, Adam Mickiewicz University, Poland, applies a naturalistic view that challenges the traditional status of music. He reexamines three phenomena to which the term "music" often refers: a natural form of communication, an art based on this form of communication, and an art lacking this form of communication.

Nino Tsitsishvili, lecturer and choir director at the University of Melbourne and Melbourne Polytechnic, notes that the origins of love songs and romantic love are commonly understood in terms of sexual selection: a feature designed to enhance individual reproductive success. Her chapter proposes a new model, according to which love songs may have developed in response to our species' conquest over the animal kingdom and the emergence of sexual taboo.

Joseph Jordania, honorary fellow at the Melbourne Conservatorium of Music, University of Melbourne, and director of the Jim Corbett International Research Group at Grigol Robakidze University, Tbilisi, Georgia, discusses the general neglect of early human defense strategies by scholars of human evolution, highlighting three so far overlooked evolutionary strategies to avoid predation in our evolutionary history: music, homosexuality, and cannibalism.

Ellen Dissanayake, affiliate professor at the School of Music, University of Washington, observes that laments, performed in many aboriginal and traditional folk societies, occupy a liminal state between nature and culture, song and speech, emotional speech and poetry, the everyday world and the

spirit world, and self-expression and public pronouncement. She proposes that, in displaying universal features, ritual laments provide a fertile arena for examining the evolutionary origin and adaptive function of musical/literary expressive narrative.

Michelle Scalise Sugiyama, senior instructor of anthropology at the University of Oregon, examines the frequent occurrence of animal characters that speak in song in hunter-gatherer oral storytelling. Each animal has a unique song, akin to a catchphrase, that references its traits. The chapter frames animal story songs as a pedagogical strategy for transmitting ethnobiological knowledge instrumental for hunting and other subsistence activities.

Jonathan Friedmann, professor of Jewish music history at the Academy for Jewish Religion California, considers the historical and cross-cultural relationship of sound/music and apotropaic magic, which seeks to ward off evil spirits, avert harm, deflect misfortune, or turn away negative influences. He contends that, although understandings of the ailment and cure have shifted from external/supernatural to inner/psychological, the apotropaic function persists in contemporary music therapy.

Michael Naylor, lecturer in race and ethnicity at the University of Michigan and director of performing arts at Washtenaw Community College, Ann Arbor, Michigan, writes that cultural competency educators believe that historical patterns of exceptionalism are reversible, even when embedded in our historical narratives and institutions. He proposes that such reversals can be achieved, in part, through exploring the effect of persecution on the intensification of creativity and faith in musical narrative.

Elizabeth Phillips, a doctoral candidate in the Department of Psychology, Neuroscience & Behaviour at McMaster University, Ontario, Canada, and Steven Brown, associate professor in that department and director of its NeuroArts Lab, argue against the standard model of the origins of musical scales based on the harmonic series in favor of an alternative model called the Interval Spacing theory. This alternative posits that scales are melodic abstractions and are shaped by physiological constraints on the vocal production mechanism.

Robert Lopez-Hanshaw, a composer and choral conductor, looks at musical change as an example of cultural evolution. Specifically, he examines the interplay between cultural values and cognitive biases within an evolutionary framework, including concepts specific to cultural evolution such as guided

variation and constrained mutation. Because the resulting patterns show chaotic behavior, the chapter advocates an agent-based modeling approach.

John Morton, a veteran British composer, discusses the meaning and relevance of creativity, inspiration, determinism, and free will and their role in a composer's life and work, with special reference to the claims of Joseph Schillinger and the proponents of dodecaphonic music.

Maja S. Vukadinović, professor of vocational studies at Novi Sad School of Business, Serbia, and Agota Vitkay-Kucsera, full professor at the Academy of Arts, University of Novi Sad, present their pilot study investigating drama students' aesthetic experience of singing voice. Their findings indicate significant differences reported when the students sing and when they listen to their voice recorded.

In mutually reinforcing ways, these studies contribute to the understanding of how and why music plays an integral role in many facets of human life, from the biological and social to the spiritual and political.

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CHAPTER 1

WHAT ARE THE GREAT DISCOVERIES OF YOUR FIELD? INFORMAL COMMENTS ON THE CONTRIBUTIONS OF ETHNOMUSICOLOGY*

BRUNO NETTL (1930-2020)

One of the tasks often facing ethnomusicologists is to explain what they are trying to accomplish, and what contributions the people in their field have made—contributions to the world of knowledge. And so I was not totally surprised when a physicist who was my neighbor at a dinner asked me, upon hearing me identify myself, "What are the great discoveries of your field?" I think he, a member of the elites of science, was not trying to be condescending. Rather, I think he was trying, given his own interest in classical chamber music, to get a sense of what I (we) was all about. I had tried to define ethnomusicology as the study of the world's musics, and of music in culture, but he wished, I think to try to define a field by its great discoveries, its major insights, wishing to know what I would provide as counterparts—modest, surely—to relativity or evolution, quantum theory or superconductivity, all of which changed our understanding of the world. For "discoveries" he might have also accepted "contributions" or maybe even "understandings" or "interpretations." I don't think I gave a good spur-of-the-moment answer, but I resolved to think about the question. Have we made a difference in the way people think about music? Aside from our "discovery" of musics not known to the world at large (but of course very familiar to the people who make it), or of exotic instruments such as the didgeridoo, of rare techniques such as multiphonic singing, of unexpected concepts such as the notion that a song is defined not by its sound but by its

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moment of creation, are there things we have discovered, or interpretations we have made, that changed the understanding of the world of music?

I looked at the record of historical musicology. Music historians would count, as great discoveries, the finding of a cache of unknown works in a trove of Renaissance manuscripts, or interpreting the way a composer's mind worked on the basis of sketches recently discovered. And surely, things we would consider interpretations—who influenced Schubert, why Wagner appealed to nationalists, how did Chopin's improvisations really sound—were important, but whether they should be considered great "discoveries," I'm not sure. But yes, establishing paradigms or accepted methods for looking at the history of music—the concept of periodization, the notion that there is a creative process—these could count as music history's major discoveries, and I guess they did change our basic ideas of the history of music. Similarly, ethnomusicologists have discovered—perhaps it's better to say "reported"—new systems of scale, rhythm, polyphony; new instruments; and new ideas about music held by many people—new to us, that is. Every time you do fieldwork and learn something new (and hope to be able to make a case for its newness in a publication), that counts as a contribution. And all of these seemingly minor discoveries, taken together, would change a person's understanding of the world of music.

One approach to answering my colleague's question might be to cite the totality of ethnomusicology as a contribution. We could say that if ethnomusicology (or whatever else you'd call it) had not come into existence, we—the Western world of academics involved with music, and people who approach music thoughtfully—might have persisted in certain beliefs we have abandoned: for example, that the particular way Western music developed, and sounds, is a human norm, determined by nature; that music is something just to listen to for fun, a kind of chocolate for the ears, and not very important to life; that normal music is melodic and harmonic, with rhythm and percussion instruments less important adjuncts; that it's best to think about music as a hierarchy, headed by masterworks of great composers, leaving the rest in the background; that the music of other cultures is inferior and has a mindless genesis. I am not sure how good a case I can make for these assertions, but you get my drift: The kinds of things that ethnomusicologists do have significantly expanded our understanding of what the world's music is like.

Well, that's a bit like saying to my physicist colleague that ethnomusicology by its existence made contributions somewhat—very modestly—analogous

to the contribution made by the existence of physics. But physicists see their fields as succession of discoveries, as paradigm, some of which might last forever, while others are replaced by advances. Is there something like this in the history of ethnomusicology? Let me suggest a few events that caused us—or ought to have caused us—to look at the world of music differently. But, caveat emptor: After making some contributions, establishing, as it were, paradigms, we have had to reverse ourselves, lay aside beliefs and understandings and theories, substituting new ones. Let me give a short summary of several things I might have told my dinner partner, of discoveries or contributions of ethnomusicology that may actually have made a difference to people in other fields.

1. The World of Music is Actually a World of Musics

This understanding seems to me to be the fundamental epiphany, and it was most significantly stated by Alexander J. Ellis in his famous article of 1885. If what is significant about ethnomusicology is its insistence that the world of music is a group of musics, then Ellis was, I think, the author who first made the belief into a general statement. Of course, earlier scholars knew that Chinese and Indian and African musics were different and interesting. And Ellis was talking only about "scales." But given the European notion that the most important thing about music was the system and relationship of pitches or tones, Ellis, were he to have written a hundred years later, might have said "musics." I think that's what he meant. And so the enunciation of a kind of general theory was made by Ellis when he said, "the Musical Scale is not one, not 'natural' nor even founded necessarily on the laws of the constitution of human sound...but very diverse, very artificial, very capricious" (1885, 526). In other words, extending Ellis's thoughts, I believe he meant that musics are created by humans and the results of human choices made on the basis of many aspects of the natural and cultural environment. That understanding—something now quite acceptable, quite obvious to us—seems to me to be the first great discovery of the field that later became ethnomusicology.

2. The Concept of Music is Not Universal

If this first paradigm was accepted, another one soon appeared, rather gradually, to question or modify it. I'm not sure whether it should count as a discovery, and at best it may have to be a negative one, such as the determination that acquired traits are not inherited. According to Ellis, the world of music consists of musics; but the question arose, just what is music,

and can we identify it when we hear or experience it? Is there such "a" thing as music? Surely, this idea must have occurred to many of the world's intellectuals and musicians over long periods, but I believe it was the contribution of ethnomusicologists to make clear that it is an issue, and to suggest that if there are discernible boundaries between musics, the existence of a boundary between music and other kinds of sound are at best unclear. The importance of ethnomusicology in the consideration of this issue involves several findings.

The concept of music is in important ways analogous to the concept of language: it is a form of sound communication for which each society (roughly speaking) has its own system, its own grammar, its own musical style, or, if you will, its own "music." But while we can always readily recognize, and agree, that a person is speaking, whether we understand what is being said or not, in any language, and while we can say that speech is a human universal, the situation is more complex with music. Western Ethnomusicologists are inclined to say that all of the world's cultures have music, that is, that they have something that sounds to us like music, but this assertion has to be modified in accordance with some incontrovertible findings. For one thing, not all cultures have in their cognitive map a concept analogous to "music" as we know it in Western culture. They may have no term for "music" (although often it has been introduced in the course of westernization), and further, although they do all of the things that we would expect a musical culture to do, they regard the various activities we subsume under "music" as different domains of culture, or they draw the boundary between music and other forms of sound in different places from ours. This may suggest that the various things that comprise "music" for us may have had different origins; for example, choral singing in sounds made by a groups—a tribe, clan, ethnic unity—to frighten enemies or predators (Jordania 2014, 121-167); virtuosic solo performance as a descendant of a kind of sound made by males to impress possible mates with their inventiveness, flexibility, energy; lullabies as descendants of sounds made by mothers to soothe young children; religious chants as coming from a privileged form of communication invented explicitly for addressing supernatural beings and not intelligible to other humans; and so on (Wallin, Merker, and Brown 2000; Nettl 2010, 110-114). In many of the world's early societies, these may have coexisted, but only in certain cultures did they become united as the concept of "music." So it's important to realize that if we say that all societies have music, this may mean quite different things in one from another.

And then, in Western culture (perhaps others as well): Can we actually define and identify a musical sound? The airplane motor in George Antheil's *Ballet mécanique* and the more than four minutes of silence in John Cage's *4'33"* are obvious and well-known examples. But children reciting nursery rhymes, or a sergeant counting cadence—is that music? People in this culture may disagree. There are many sounds which, if explicitly included in what is labeled as a musical composition, can be accepted as "musical"; but they might not be when produced elsewhere. Indeed, it would seem that the concept of "music" in Western cultures may be best defined by social context—such as the assertion that whether a sound is musical depends on whether one hears it in a concert. (I am jesting, but the principle is serious.)

So, if one paradigm of ethnomusicology is that the world of music consists of distinct musics, a second one is that societies not only differ in the nature of their musical styles, but also in their conception of music, and in the ways in which they classify the world of sound. "Having music" may mean quite a different thing at several levels of conceptualization in different cultures.

If this understanding can be considered a kind of paradigm, a contribution of ethnomusicology, it may be one that doesn't make everyone happy. Or, in denying the fullest measure of music everywhere as a universal, it may contribute to the understanding of the variety of human societies and musical cultures.

3. The Three-Part Model of Music Provides a Way of Comprehending Musical Cultures

Today many of us define ethnomusicology as "the study of music in culture" or less formally, as Jeff Todd Titon has said, "the study of people making music" (Titon 1997). But we may also think that this is hardly a distinctive trait of ethnomusicology. Virtually every tradition of writing about music, going back to the ancient Greeks, took an interest in explaining the relationship of music to culture in some sense. And when musicology as a profession was developed (Adler 1885), historians of Western music wrote volume after volume relating music to culture, or, as I would prefer to put it, to the rest of culture. For distinguishing ethnomusicologists, then, can we simply say that they place more emphasis to the relationship of music to the other domains of culture? Or can we tease out, from the history of our field, a particular insight or interpretation that may count as a "discovery" or "contribution"? I suggest that this may be Alan Merriam's model presenting

music as consisting of three components, all equally important, always coexisting, and each of them constantly influencing, and also being influenced by, the other two. This model—you know it surely, it consists of ideas about music or "concept," behavior that results from or leads to or accompanies music, and the music as sound—is relevant to the general understanding of music and culture but in particular it is intended as a kind of guidepost for ethnomusicologists (Merriam 1964, 33-34). This contrasts with an approach that studies musical behavior and ideas, but always, and only, with a view to seeing how they affect or determine the "music itself," how they help us to understand the sound.

Merriam's model can lead to an understanding that while much of our study still involves trying to see how ideas about music in a culture lead to a particular musical style, music is also important in ways that do not concern its function as sound at all. Ideas about music are more than simply the "cultural context of music." We would not be justified, for example, in saying that a book such as Hugo Zemp's classic *Musique Dan* (1971) is "merely" about cultural context. Allow me an example from my own experience (Nettl 1989).

The styles of Native American songs are certainly interesting but hardly very complex, and in my experience of the Blackfoot people of Montana, for example, these people themselves didn't seem to think that the structure of songs was worthy of much attention. To them, Western music—which they called "white" music—now *that* was complicated music. One had to know a lot to perform it, including reading music and understanding harmony. But white people, some Blackfoot singers told me, didn't think very deeply about their own music, they only enjoyed its sound.

But the Blackfoot people, I discovered from interviews and observations and older ethnographies and myths, actually had a very complex system of ideas about music which had a role in culture well beyond singing; the concept of song seems to have had an independent existence in speech and thought. For one thing, music was a reflection, a kind of counterpart, of the whole of life. The most important myth about the origins of the Beaver medicine bundle, perhaps the most fundamental ceremony, told how each animal or bird had its own song and its supernatural power. The right way to do something is to sing the right song with it; everything has its song. A man would expand his musical knowledge by having repeated visions in which he learned songs and by moving through a series of age-grade societies, each of which had its songs. The old man, the most respected, was also the one who had learned the most songs. And further, songs are like

objects: they can be given, traded, bought, inherited—though just what constitutes the identity of a song is not totally clear—and as a result, it is believed that songs cannot be divided, or changed.

Thus, Merriam's three-part model of music leads us to a more holistic way of contemplating music as a domain of culture.

4. Musical Creation is Best Seen as a Long Continuum: Improvisation to Composition

I think I must apologize for ethnocentrism here, that is, for using American English as my point of departure. Webster's dictionary (1968) defines music as "the science and art of incorporating [tones] into a composition having definite structure and continuity." Well, I'm not sure whether English-speaking people in any part of the twentieth century would have accepted this, but no doubt for a long time, academics and musicologists divided musical creativity into two categories: proper composition, an art, with notation, as carried out by Beethoven-like figures, and various other ways of making music come about—composition in orally transmitted musics, and improvisation, and related processes—taken together, a kind of craft. The fact that improvisation is taken seriously by scholars and educators today is to a large degree a contribution of ethnomusicologists, who undertook to look in detail at cultures in which improvisation is a specialty—for example, jazz, classical musics of South and West Asia, South Slavic epic poetry. So, by the 1960s, it was admitted that there were two easily separable ways of creating music—precomposition and improvisation. I am not sure just when the next paradigm appeared, and whether anyone can be identified as its principal innovator, but I think the next stage in this process has been the understanding that virtually all music is the result to some degree of both of these kinds of music-making. All performances make use of pre-existing material—a score, a memorized song, a set of chord-changes, a set of rules, a type of expected sound; and every performer introduces important personal creative elements. If you wish to quantify, it may not be much in a Beethoven sonata, and it is a great deal in an Indian alap, to give obvious examples; but both elements are always present (Nettl 1974).

5. The Creation of Boundaries, Once Helpful, is No Longer an Effective Way of Understanding the World's Music

Is this a discovery? A contribution? Or a correction? In the second half of the twentieth century, ethnomusicologists abandoned the concept of boundaries as a significant guide to study—boundaries in their own conceptualizations, and boundaries among musics. This is a large area, but one of the important boundary concepts has been the idea of authenticity. Early comparative musicologists, and even more, folk music scholars, were very concerned with authenticity, a term used to denote ad distinguish what was truly representative of a culture and had perhaps been there from the beginnings, and was shared by all members of a society. Folk song collectors such as Béla Bartók wished to be sure to find the songs that were the true heritage of the villagers, distinguishing them from recent imports, from influences from a minority, or something concocted by urban composers, or popular music brought from the city.

And so one learned, when ethnomusicology was developed a century or so ago, to seek the authentic music of Africans, Oceanians, European villagers, and Native Americans, not what had developed in recent times as a result of contact with white people. And we learned to avoid popular music, in part because of its commercial basis, but more, I suspect, because it was almost inevitably the result of cultural mixes. Well if you compare that view with ethnomusicology as we see it today, the difference is like night and day. Looking at the programs of conferences, I'm struck by the emphasis on three things: Popular music all over the world, meaning music that is mass-mediated; analysis of how things have changed, what recent developments, how the world's peoples deal with current challenges; and change from the study of unicultural to multicultural venues.

Before about 1950, the normal venue for ethnomusicological and anthropological fieldwork was the village or small tribal society. This was the focus of the early anthropologists doing extensive fieldwork such as Franz Boas, Bronislaw Malinowski, A. H. Radcliffe-Brown, and I guess of the earliest collectors of non-Western music. Even the scholars involved with musics that were practiced in urban venues—Indian or Japanese classical traditions, for example—looked at them as isolated phenomena. The model for ethnomusicological contemplation was the village or the small tribal community, or maybe the isolated urban ethnic group, and we thought of musical culture as originally something in which all people

shared, of repertories which were known to all in a small society, of musical contexts known to all. I know that was totally unrealistic, all cultures are far from this pristine kind of society, but I think we tended to regard this as a kind of primordial ideal, a norm, from which many peoples then departed. Well, things have completely turned around in the last fifty years, for me and maybe everybody. The vast majority of studies involved music in which there is significant interaction of cultures, genres, repertories, styles, and musicians.

6. There is No Single Determinant of Musical Style

I come to what I have often considered the central question of ethnomusicology—what is it that determines the musical style, the musical system, or the basic character of the music of a society? I confess that I am not sure whether my colleagues will agree that this is so central; but I have difficulty imagining anyone in my field who has not at various times posed this question—why did *these* people create *this* particular kind of music?

The literature of ethnomusicology, and of musicology at large, is full of explicit statement or suggestions, broad and narrow. Thus: Antiphonal music of the Baroque resulted from the architectural structure of a church in Venice (e.g., Bukofzer 1947, 20-21); but polyphonic music generally resulted from the need of people to make sounds, not in unison, to frighten enemies or predators. Or, the complexity of Western music is a reflection of the proclivity for complex technology. The differences among the world's musics comes from the fact that at one moment in history we find each of them at a different stage of a common development. Or, the musical style of any culture, but its singing style and the general nature of musical sound in particular, result from the typical nature of its social organization and the quality of its interpersonal relationships. The basic style of a music, but the typical size of intervals in particular, result from the relationship of between the sexes and the elative power of each (Nettl 2015, chapter 22). It has been suggested that whether a society develops polyphonic music is genetically determined. Or, it's all a matter of the luck—musical development comes about through the ability and work of born geniuses. The nature of intervals results from the way in which the harmonic series is used or modified by wind instruments naturally discovered. There are plenty of scholars who have given one or another of these alternatives the principal role in determining musical style.

So what is the contribution of ethnomusicology? Ethnomusicologists have tried to find the implication of Ellis's paradigmatic statement, that musical

scales are equal in quality, equally natural or unnatural, diverse and artificial. I believe that if ethnomusicologists have contributed anything it is their not very systematic examination of these alternatives, and their tendency, as a group, to discard each of them as a valid general explanation. If there is a discovery, it is, I believe, that a large number of factors determine the music of each society. There is no one grail at the end of this ethnomusicological quest. The character of each music is determined, I think we now largely believe, by a number of factors comprising the cultural, natural, intercultural, technological, and biological environments. If this counts as a discovery, it must be one of the discoveries that deny conventional wisdom—we have discovered that something widely is not true or valid.

7. Our Findings Have Had Practical Results

Speaking to ethnomusicologists about the history of the field, I would at some point have to say that the last twenty-five years have been characterized by an important new trend—the development of a number of directions and initiatives which together have been named "applied ethnomusicology." To my dinner partner, I could also have put it this way: The kinds of things that ethnomusicologists have discovered, have learned, have had some practical results—modest, I don't want to present excessive claims—changing aspects of musical culture, and of other domains of culture. When I began study, about 1950, I was sometimes asked whether my kind of study would do anyone any good. I didn't have a good answer except to say that the accumulation of knowledge was surely a good thing; other replies might have been trivial, such as uncovering music that Western composers could use as inspiration. But now, over a half-century later, it has become clear that what ethnomusicologists have learned can have significant practical benefits of many sorts, and they have been united under the term "applied ethnomusicology"—a term at first considered mildly condescending, but eventually seen as deserving dignity and respect.

I cannot summarize comprehensively, but let me mention a few directions (Nettl 2015). The area receiving the most attention is the relationship of ethnomusicology to music education, broadly defined, which involves several initiatives. There is the presentation of a world of musics to children in each culture, with the purposes of providing a global context for whatever music is the group's own, for broadening horizons, for combating ethnocentrism, and for broadening musical experience; and for showing that all musics, and all human cultures, are worthy of respect and have things to

offer. And there is the use of music for the education of minority and immigrant populations, for the education that provides insight into their culture. And in a somewhat different direction, this includes the study of musics of the world in tertiary education via hands-on performance, all of this coming from the introduction of performance study as part of field research.

The effect of ethnomusicology in other cultural domains may be less direct, but the point is, I repeat, that the knowledge developed by ethnomusicology has practical uses. These include the use of music in conflict resolution, the protection of intellectual property of non-Western and folk cultures, helping societies in the preservation of traditions by recording, archiving, repatriation, by helping to administer festivals and schools, and by finding ways to ease cultural transitions. Significantly, they include the understanding that music can play a significant role in furthering social justice. And ethnomusicologists have even become involved in ways of saving the environment, as in Titon's concept of "sustainable musical culture" (Titon 2013, 1992). Ethnomusicologists have become involved in fighting cultural impoverishment in many parts of the world. It is important in this context to point out that one of the principal leaders in applied ethnomusicology has been Professor Svanibor Pettan (1998).

So, I suppose one of our discoveries is that what we have learned can be of practical benefit.

8. Ethnomusicology as Critique

The final thing I would point out to my colleague: Ethnomusicologists have been the skeptics, the naysayers, the people who provide response to ethnocentrism and to facile generalizations, some of them sometimes made by members of other musical disciplines. An important contribution of ethnomusicology has been to contradict and correct the received wisdom of others, their own earlier paradigms, but particularly beliefs that come about through reference to only one culture.

Thus, in important ways, the field of ethnomusicology has at times functioned as a critique of general musicology—or more specifically, historical musicology. A good deal of its rhetoric is presented as response to the typical traditional academic's view of music, contradicting and correcting conventional wisdom and accepted knowledge. When I was a student in the late 1940s, I was one of only two or three in my institution studying what would later come to be known as ethnomusicology,

interacting with a much larger group of music historians—I found myself constantly responding to generalizations about world music (or just plain "music") with contradictions such as, "yes, but in Central Africa they don't do this," or "it's quite different among the Arapaho." And when confronted with assertions about the specialness of Western music and its theory, I would say, "no, they have something equally complex in India." At that time, if someone had told me that ethnomusicologists were interested in universals, I would have countered by pointing to the specialness of each culture. And in the end, I find myself still espousing this view.

But more than a half-century earlier, the contradiction of conventional wisdom characterized some of the field's earliest publications. A. J. Ellis's epochal article, already cited, of 1885, ends on this kind of a note, telling us what music is not—not natural, not founded on the laws of musical sound, not one thing. A few years later, Carl Stumpf, too, tried to correct widely held assumptions. A quotation in a review essay about the earliest publications on Native American and First Nations musics sounds interestingly up to date: "Die indianischen Leitern, wie wir sie bisher kennen, gehören also keineswegs einem 'archäischen' oder gar 'primitiven' Musikzustand an...Die Beziehung zwischen den Tonauffassungen ganz andrer Art sein, ebenso die psychologische und die historische Entstehungsweise..." (Stumpf 1892, 142). Stumpf is asserting that the Indian scales, as we know them at this point, do not belong to an archaic or primitive condition of life. To understand them, one must accept the existence of a great variety of understandings about pitch, and a variety of psychological and historical conceptions of their origin.

Twenty years later, the first article to speak to the special problems and methods of what was called comparative musicology (Hornbostel 1904-05), also distances itself from traditional musicology. Three of his points struck me as especially interesting. 1) Hornbostel maintains that comparison is the principal means of scholarly comprehension, and he clearly means neutral and not value-loaded intercultural comparison. This has been an abiding defense of comparative approaches in the face of severe criticism leveled at it since about 1950. 2) Comparative musicologists must broaden their perspective of the kinds of phenomena in music that should be examined, going far beyond "tones" to a great variety of sounds, including those that are intermediate between music and speech, music and noise. Hornbostel, by implication, attacks a narrow conceptualization of music. 3) Music is changing rapidly, and one must "save what can be saved, before airplanes are added to automobile and electric trains, and all of Africa is dominated by tarara-boomdeyay" (Hornbostel 1904-05, 97), emphasizing the importance

of preservation as central to the field but recognizing the need to take change into account.

One would expect the new field of comparative musicology that became ethnomusicology to begin on a positive and optimistic note, but actually, both Stumpf and Hornbostel sound a bit pessimistic. Their contrasts with that of the enormously influential earlier article of 1885 by Guido Adler that lays out the discipline of musicology—centered on historical study of European music—in a positive and optimistic mood, seeing a process of consistent progress towards a clear goal: "Jeder Schritt, zu dem Ziele [Lösung grosser wissenschaftlicher Aufgaben] führt, jede That, die uns ihm näher rückt bedeutet einen Fortschriftt menschlicher Erkenntnis." [Each step that moves us closer to our scholarly musicological goals signifies progress in our understanding as human beings] (Adler 1885, 20). In contrast to Ellis and Hornbostel, Adler wants to look forward and does not complain that his earlier colleagues had been on the wrong track.

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CHAPTER 2

NINE REASONS THAT SUPPORT PREHISTORIC HOMININ MUSICALITY AND MUSILANGUAGE

JOHN COLLINS

This chapter examines the importance that music (pitches, melody, rhythm) may have provided as a component of the non-symbolic vocal-gestural communication of the first small-brained hominins Ardipithecus and Australopithecus,[1] and of the non-grammatical but nevertheless symbolic musico-gestural languages of the later and larger-brained Homo genus that followed; namely Homo erectus and its offshoot Homo heidelbergensis.[2] Many evolutionists have noted that musical tones were likely to have been ingredient of the language of primordial humans, beginning with Charles Darwin (1871), who believed it emerged out of mating-cum-territorial songs that in some primates plays a role in sexual selection. More recently a number of evolutionists have noted that music and language were "neurologically intertwined," as American neuro-anthropologist Dean Falk puts it (2000, 197-216). In fact, some have actually given names to the early Homo musical proto language, such as the "hmmmmm language" of British archaeologist Steven Mithen (2005),[3] the "prosodic proto-language" of Austrian cognitive biologist Tecumseh Fitch (2009), and the "musilanguage"

[1] The first bipedal hominin was the tree-dwelling Ardipithecus of Ethiopia that appeared 4.4mya, followed by several variants of Australopithecus that, between 1-4mya, lived in eastern and southern Africa.

[2] It was probably a gracile Australopithecus similar to the garhi type of Ethiopia that gave birth to the Homo genus, the very first being Homo habilis 2.5mya, followed by Homo erectus (aka ergaster) some 1.9mya and Homo heidelbergensis that began evolve out of it from around 700,000bp.

[3] This strange word of Mithen comes from the language being Holistic, Multi-Modal, Musical, Mimetic, and Manipulative. Furthermore, he believes (2005) that not only early members of the Homo genus but also "singing Neanderthals" used this type of language.

of Canadian neuroscientist Steven Brown (2000), which is the expression I use in this article.

The first in the Homo line that would have been capable of inventing such a musilanguage (cf. the instinctive calls and songs of primates and earlier hominins) would have been late populations of Homo erectus, with one evidence coming from their increased neocortex ratio that, according to Aiello and Dunbar (1993), is a more reliable indicator of primate social intelligence than just brain volume. Moreover, by one million years ago erectus was living in larger groups than earlier hominins and, being the first hominin persistence runners, were adding a hunting component to their foraging and gathering activities.

Other clues of more sophisticated Homo erectus practical, cognitive, and cultural intelligence are their making of increasingly symmetrical Acheulian handaxes, their use of fire, their possible use of water craft by 850,000bp (Bednarik 2003), and building huts in Japan by 500,000bp (Schuster 2000). As will be discussed later, there are also hints of symbolic behavior appearing in erectus 400-500,000bp in the form of engraved shells and bones, circular rock cupules, a possible mortuary rite at Bilzingsleben in Germany, and a proto figurine found in Morocco. This evidence all suggests that sometime after one million years ago Homo erectus was beginning to develop a "man-made" culture and a non-grammatical but nevertheless symbolic language. The latter was based on combining its individual calls, cries, utterances, and pitches into a number of short, fixed, holistic, word-like melodo-phrases that could, in a socially agreed way, be referentially attached to objects, actions, and situations, including ones displaced in space and time (Tomlinson 2015; Bickerton 2009)

How many such individual or combined proto words they could make is a moot point; however their vocabulary may have been around one thousand, as captive apes have been trained to recognize between 350 and 1000 visuo-gestural "words."[4] Although the one thousand vocal-gestural vocabulary of early members of the Homo line did not reach the minimum two or three thousand words needed to speak a modern language, it would have provided it with a viable form of communication.

[4] The bonobo "Kanzi" and the chimp "Washoe" used 350 visuo-gestural "words," and the gorilla "Koko" learnt 1,000 sign language signals. See Savage-Rumbaugh (1986), Savage-Rumbaugh and Lewin (1994), Dell'amore (2012), and Patterson and Matevia (2001).

Before proceeding to the evidence that supports a musilanguage, I will briefly provide some details of the neural and physiological changes that took place in the early Homo genus that, as compared to earlier hominins, facilitated language faculty. By the time of Homo erectus this included an increased encephalization[5] and functional lateralization of its cortex that resulted in the appearance of a specialized proto Wernicke's "auditory" area in its left temporal lobes. These changes also resulted in a proto Broca's "speech" area and associated "mirror neurons" in its left frontal lobe that together provided Homo erectus with the capacity to mimic, learn, plan and manipulate their sing-song and gestural musilanguage expressions.[6] Increased innervation of the lips, tongue, and soft palate of Homo erectus also improved its ability to make pitches, vowels, consonants, clicks, and whistles (Boë et al. 2017), whilst its smaller teeth provided more space to modulate the sounds produced by its vocal cords. American anthropologist and cognitive scientist Philip Lieberman (2015) calls the coming together of multiple neural and physiological features that enhanced the Homo ability to speak and sing an "evolutionary confluence."

Around 600-700,000 years ago an early archaic form of man began evolving out of Homo erectus called Homo heidelbergensis (aka Heidelberg Man), which some see as a separate species and others as simply a continuation of Homo erectus. Whatever its exact relationship to Homo erectus, Homo heidelbergensis had a cranial capacity 93% that of humans and a more pronounced cortical functional lateralization than its predecessor. Moreover, around half a million years or so ago,[7] a series of genetic sweeps occurred in Heidelberg Man that involved mutations in two of the amino acids of its FOXP2 gene, that began to convert it into the "language gene" found in Homo Sapiens.[8] This language gene increased the neural connectivity and plasticity of this early archaic man, which not only enhanced the "primary" language areas of its left cerebral cortex (i.e., the

[5] The cranial capacity of Homo erectus was 60-75% that of humans.

[6] The mirror-neurons in the frontal lobes of primates play a role in their gestural communication, but in the Homo genus the left (dominant side) ones switched more to vocal communication, which resulted in the gestural theory of the origin of language known as the "mirror system hypothesis" proposed by Mithen (2005), Arbib (2012), and Giacomo and Craighero (2007).

[7] Krause et al. (2007) and Staes et al. (2017) say 400,000bp, whilst Lieberman (2015) says 500,000bp.

[8] This mutated gene is present in all the three varieties of Homo sapiens: namely, modern humans and in the DNA extracted from the fossil bones of our Neanderthals and Denisovan cousins.

Broca's and Wernicke's areas and interconnecting language loop), but also resulted in the beginning of "secondary" and "supportive" language areas,[9] as well as a more direct cortical pathway being established to its throat muscles that improved its ability to articulate. Moreover, fossil evidence from the 430,000bp "Pit of Bones" ("Sima de los Huesos") cave site in northern Spain suggests that the hyoid throat-bone of late Homo heidelbergensis had become wider and more human than those of apes and Australopithecines (Martinez et al. 2008; Cangelosi et al. 2006, 154), and so provided greater surface for the attachment of muscles involved in speech. Indeed, British archaeologist Iain Morley (2002, 200) says that Heidelberg Man had a "vocal apparatus that was essentially fully modern," although as its larynx had not fully descended into the throat its musi-speech would have been high pitched. Moreover, this early archaic man's greater human-like cortical control of its voice would not only have improved its ability to speak, but also to chant, whistle, and sing simple melodies based on the few pitch intervals that were already present in its prosodic sing-song musilanguage. Consequently, as South African archaeologist Sarah Wurz (2009, 411) puts it, this hominin could "consciously create and manipulate melodies in the modern musical sense."

Despite all this cognitive and physiological improvement, Homo Heidelbergensis continued to use the holistic musilanguage; and in fact, fully grammatical language only became possible in the Homo genus with modern humans, who first appeared in Africa around 300,000bp, when further mutations occurred, including to its FOXP2 gene,[10] which by 200,000bp so improved their grammatical segmenting, sequencing, and syntactic faculty that they were able to construct and compose limitless numbers of different sentences and songs. Grammar is a far more effective, flexible, and open-ended form of communication than the musilanguage, which was a closed form based on a number of fixed vocal-gestural expressions; albeit, and as discussed later, with a limited degree of proto-syntax that even some primates are capable of. Consequently, the more efficient, open, and recursive grammatical language became the human one.

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[9] In humans the insular cortex (especially the left) is a "secondary" language area, and the limbic system's basal ganglia has a "support" role.

[10] According to Fitch (2018, section 8) higher resolution gene sequencing techniques have revealed that in humans further changes occurred in the FOXP2 gene (in its noncoding regulatory region) which are absent in Neanderthals, suggesting this was unique to our species. (Also see also Maricic and Gunther et al. 2013.)