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The Oxford Handbook *of* COMPUTER MUSIC

CHAPTER 25

SOUND-BASED MUSIC 4 ALL

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As a composer and enthusiast of various forms of contemporary music trained in the 1970s, I am used to writing about the inevitable frustrations of someone who is passionate about his music but also someone who works in a society that has largely ignored such forms of music.[1] In other words, there has been a clear tension between the amount of effort that goes into the creation of certain types of contemporary music and the related societal impact. I believe that for decades many of our societies have suffered from what I would call a manipulated imbalance of appreciation regarding various types of music and have always felt that much contemporary music, including new and innovative forms of music that are reliant on new technologies, have been harshly treated. In contrast, this text possesses a positive spin in that we shall discover how the increase of accessibility of tools and of interest can be related. To understand the evolution that contributed to this change, we need to investigate the circumstances that led to certain types of music's isolation and then look into how the increased availability of digital means of music appreciation, music-related knowledge, and music-making has been effective in terms of increasing the accessibility of the music. Related to these developments is a parallel evolution in which certain common forms of music classification are becoming less relevant to certain repertoires, thus breaking down barriers that prevented people from discovering certain types of contemporary music. Alex Ross has described his view of the blurring of boundaries as follows: "One possible destination for twenty-first-century music is a final 'great fusion': intelligent pop artists and extroverted [art music] composers speaking more or less the same language" (2007, p. 542). In particular, in the case of the focus of this chapter, sound-based music, that is, music in which sounds, *not* notes, form the basic unit,[2] the separation of art music and popular music

is clearly becoming less relevant as the distinction becomes less audible in a great number of sound-based works and the means of production converge, opening up this type of music to a much larger community than the one it has known in the past.

1. CONTEXT XX

Our tale commences in the previous century (also known as XX) when two developments strongly affected the lot of most contemporary music: the commercialization and the industrialization of music. The launch of an era of technological progress, namely, the "age of mechanical reproduction" as Walter Benjamin called it (see, e.g., Benjamin 1992), changed how music was to be produced, disseminated, and most importantly, listened to forever. Stating the obvious, just over a century ago, to hear music one had to be present where the music was being made. Today, one can hear anything at any time at the push of a button (or other interface) thanks to the industrialization of music. Then, there is the influence of commerce. The commercialization of music in the 20th century led to a seismic shift in musical interest in many parts of the world.[3] The reductionist version of this shift is that many forms of traditional, noncommercial aurally transmitted folk music and, to a lesser extent, art music—in particular its contemporary forms—declined in interest as the interest in more trendy and more globalized forms of popular music climbed rapidly.

However, the era of analog mechanical reproduction and the age of digital mechanical reproduction have had dissimilar effects in terms of community forming. Therefore, today's context is fortunately evolving away from the pattern described in this first part of the chapter, at least as far as new forms of music-making are concerned. The growth of the power of the music industry, a product of the ability to reproduce music, is one of three contextual threads related to musical marginalization, alongside that of music education and the attitudes of many of the musicians involved with contemporary music.

The focus in this first part of the chapter is on contemporary art music. I believe the wider repertoire, that is, that including vocal and instrumental contemporary music, is important to discuss here as what is commonly known as electroacoustic music and computer music both inherited great challenges from contemporary music's demise. I then focus on digital music-making, followed more specifically by sound-based music.

A. The Communications Media, in Particular Broadcast Media, and the Recording Industry

One of the questions I have often asked of undergraduate students in countries where I have lectured is: "How many of you know much traditional folk music

from your area?" This question is often met with laughter, and normally very few hands are raised. Although for centuries this type of communal music formed part of community behavior, it has become an object of ridicule in many quarters of today's societies. In fact, in many of these countries folk music has had to be reborn as a form of commercial music. Granted, there are countries where folk music has hardly been affected; most of these have not undergone such huge technological changes as in the countries where I have worked.

Perhaps many readers feel sympathy with the students when reading this often-encountered description. I, for one, am not a proponent of preserving part of one's culture for the sake of it. Still, the loss of music that is a form of celebration of local or regional identity, and its replacement by products offered as part of our consumer society, does raise issues concerning who is empowered in terms of musical knowledge, choice, and musical behavior in general. The virtual erasure of a type of music as old as human existence is no trivial matter.

The fact is that as soon as the recording and broadcasting industries took hold of music dissemination to a large extent, music appreciation and music-making would inevitably change radically. Other than in countries with state broadcasters who are contracted to represent the entire spectrum of music in a balanced manner—and these are few and far between—music on offer is based on numbers of listeners, advertising income, and similar factors (not to mention political factors in some countries). Similarly, the number of nonprofit recording companies is highly restricted. The fact that such companies often request a subsidy from the musicians or their organizations for their recordings comes as no surprise.

This combination of revenue or statistics-based broadcasting and profit-motivated recording led to the empowerment of those industries. The critic of this era, controversial as he may be these days, Herbert Marcuse, often complained that such empowerment was to lead toward a quantity as opposed to a quality culture (see, e.g., Marcuse 1964). This has proven true to a large extent but looks to change in our young new century.

How was this commercial empowerment reflected within the spectrum of contemporary art music during this period? In those areas possessing highly subsidized musical cultures, whether through state or other forms of support, contemporary music seems to have been able to offer a reasonable amount of activities and, indeed, recordings. Still, one should take into account the fact that the number of participants grew during that period, reflecting the increase of population. The number of events, however, did not increase in a similar proportion. The number of art music concerts focused on or containing contemporary works was far outweighed by that of the key historical periods, baroque, classical, and romantic. Only the older works of the Middle Ages and Renaissance were treated as somewhat exotic, much like a good deal of the contemporary repertoire. In this regard, I have often spoken of the late 20th century's "rainbow of appreciation in Western art music history," with the two far/lower ends less visible than the middle.

I remember when I was a student that a comic was published mocking the contemporary music scene. This comic was by Matt Groening (before he became

famous with *The Simpsons*); in his work, one composer asked another one whether he was sick and tired of performing his music "before 47 spectators" (Groening 1997).[4] In a similar vein, the French critic, festival organizer, and politician Maurice Fleuret was alleged to have described a contemporary music practice in the 1970s and 1980s in terms of Kleenex—use once and throw away—thus suggesting that a work's première was also its dernière. Such remarks typify the odd situation known to many late-20th-century contemporary music composers: few performances, few recording opportunities, and even fewer broadcasts.[5] Contemporary musicians who formed exceptions, such as most minimalist composers, were those whose music contained elements that were also available in accepted genres emanating from the music industry, including harmonies and rhythms from jazz and folk music's commoditized version, world music.

We must not forget that as we approached the end of the XX century we also became part of what is commonly called the "image culture." Television, of course, was never that interested in contemporary music. When it was, it tended to create clumsy MTV-like broadcasts of works with many cuts between the cameras in an attempt to avoid the viewer's becoming bored with a still image, leading to generally unrewarding visual experiences. This in itself is one of the major reasons why people never became acquainted with this repertoire.

It is my firm belief that, other than through the influence of a youth's parents, music teacher, or the fact that a friend was acquainted with contemporary music, it was nearly impossible for a young person to become aware of its existence. Another complaint that I have often uttered is that we are immediately informed when a football player or rock star is injured or some such, but most people would not have a clue if a major work of art music had been composed in their country. In fact, in contrast to the 19th century, the notion of a "major work" seems to have diminished in stature somewhat as the 20th century evolved, although most colleagues in the field would probably leap to offer some exceptions. In a sense, contemporary music found means to survive in spite of the broadcast and recording media.

B. Music Education

As stated, few preuniversity children were introduced to any form of contemporary art music and other forms of innovative music. This is still true today. How then can they be expected to discover it?[6]

Music education is a difficult subject as in some countries it forms part of the "rest of" group of subjects after reading, grammar, writing, mathematics, science, and history. Some countries have dropped music from the list of compulsory subjects at the primary level, and in many secondary schools students can opt out of musical study. So, what can one propose in such a situation? Beyond demonstrating the obvious skills that music-making offers a young person, one thing is to build from the known to the unknown; this may, for example, involve a

greater emphasis on popular music at schools. Another is to offer children the widest repertoire possible at a young age to allow them to be more aware of the choices that exist. To achieve this, educators need to be convinced that people can enjoy this wider repertoire. One example of an approach supporting this goal, the Intention/Reception project, is introduced in this chapter. Finally, there exist new technological tools that can facilitate musical creativity. I return to this point in the discussion regarding the EARS Pedagogical project. Fortunately, there are signs of a growing interest in terms of dealing with inexperienced listeners of various ages (see, e.g., Brown 2007, Hugill 2007, and chapter 26, this volume).

Attempts have been made to modernize music curricula in schools. Many have been approved by governments and were later to fail for financial reasons or due to the reticence of teachers responsible for music. What then will cause these useful changes to occur? Part of this answer must come from parents and the general public expectation for their nations' education to reflect and support musical diversity. The other must come from education itself, probably led by those in higher education who believe that the music they are teaching and eventually making is worthy of a broader community of interest; thus, these educators must find means to lobby through constructive changes that are more representative of music in society today and help pave the way to a better musical balance tomorrow.

One can study any type of music at universities these days. In the United Kingdom, music technology and popular music students now outnumber "traditional" music students at university level. Thus, the market economy is reflected within the university sector for better or worse. With such a broad presence within higher education institutions, why is there such a gap elsewhere in education and in our societies at large? This gap is relevant to people both young and old.

One of the main reasons for the isolation of contemporary music has been a generally elitist attitude, including within the university sector where contemporary music is offered. Contemporary music is often learned music, just like a good deal of Western art music of the past. The problem has been that one has had to become even more learned than in past centuries to appreciate many of these new forms of music. (Just think of many works composed as part of the quest for new forms of musical complexity.) Has this led to a situation where one needs to leave one's cultural passport at campus gates? Who from the universities is going to be able to facilitate the creation of broader audiences in such circumstances? Actually, things are not quite as black and white as they are being portrayed, as demonstrated in the following section.

C. The Separation of Art from Life in Many Forms of Contemporary Music

Thus far, the massive sea change of appreciation has largely been attributed to the cultural or creative industries—unthinkable terms before the previous

century—and our education systems. Contemporary musicians, including many of those working in higher education, also share a good deal of the guilt for the marginalization of their music. The basis of the accusation is as follows: There has always been an element of avant-gardism in art history. It has varied throughout the ages and reached a climax with figures such as Charles Ives in the first half of the 20th century. These were artists whose music really was ahead of their time. Things caught up in a way as the "anything goes" trends of the latter half of the century meant that there was a public for anything, regardless of how small it might be.[8] An attitude in the late 20th century was one of laisser aller and see what happens. This attitude has allowed marginalization to grow deep roots.

In traditional societies, art was always not only part of life, but also integrated into one's daily activities. In high art traditions, art-making and appreciation follow their own rituals; however, the integration of art music with most aspects of our daily life has diminished over the centuries. Contemporary musicians, aware of their work being marginalized, in general have not demonstrated a great interest in addressing this increasing separation. This is ironic as potential listeners often need to make connections with the known when trying something novel. It is even odder when we consider the fact that music involving sounds related to daily existence can offer an immediate link to life.

However, not all of this music is that complex, is that detached from life, or needs a learned public. Works ranging from certain instrumental pieces by György Ligeti to many sound-based works by Bernard Parmegiani offer immediate access to listeners with no background in these repertoires. My view for the last decade and a half has been that when music is suffering from marginalization, offering a helping hand may aid in reaching greater levels of appreciation. This helping hand may take on the simple form of educational and community arts outreach. It may also involve offering the listener something to hold on to in their works[9] to help them over the threshold into the musicians' own sonic worlds as have the two composers mentioned. Even the sharing of artistic intention, when it can be articulated, is a form of communication with potential listeners. Most composition students, however, are taught how to compose, not to share the "why" of a work or to engage with potential listeners. This attitude of not offering a helping hand to these listeners has contributed at least as much to the music's marginalization as anything else.

In terms of technology-driven music during this period, a key factor, at least until the 1990s, was the fact that most equipment was not affordable to individuals. It was those musicians attached to universities and studios who gained access to most equipment, another form of elitism. In a sense, outreach activities involving music technology were counterproductive at that time as one could only introduce a means of working and then take that means of working away at the end of a workshop or residency. Today, in contrast, it is more likely that what one takes into a residency is consistent to a large extent with what is already available to those participating. People like to be introduced to things that they can continue to make themselves after all. This leads us across the century border.

2. CONTEXT EARLY XXI

The first part of this chapter described a context we are gradually leaving behind as our digital tools become increasingly available. This second part focuses on the consequences of the availability of many of these tools and is followed by a section focusing on how these consequences can play a favorable role in the development of one form of contemporary music, namely, sound-based music.

Music Communities + Tools = Increased Awareness

The music business may be as large as it has ever been, but it is changing extremely rapidly during this first decade of the 21st century. The key reason for this is the Internet coming of age. Our focus in this part of the chapter is not about how musical industries are reacting to the changing technology; instead, it is on the roles of the technology itself.

Although computer-based communication has been around for quite some time, it is only in recent years that one has discovered the vital and wide-ranging potential our computers and other digital objects offer in terms of communication. For the purposes of this section, I divide the discussion in three, concentrating on music appreciation, information/knowledge related to music, and music-making. The hypothesis here is that through increased digital communication many sorts of music are becoming more accessible to more people than was the case even a decade ago. Through the increase of this information and the related means of communication, awareness is increasing, and consequently communities are being formed, some more spread out geographically than previously and some with new foci. This in turn is supporting new means of appreciation and music-making, thus enhancing today's broad horizon of musical opportunities. The following discussion is not meant to be exhaustive but instead to demonstrate new means, some quite radical, related to music and information related to music.

Just a decade ago, we listened to music on CDs and on the radio, learned about concerts and broadcasts in the printed media (e.g., newspapers and journals), and performed music with others involving physical presence. All of this is still available today.

Today, we can also listen to music on the Internet or download it onto our iPods, learn about concerts on the Web or be informed about them on various bulletin board systems or by way of user groups, and perform music virtually. In fact, in the first two cases a significant percentage is involved. In other words, a large amount of music is reproduced involving digital transmission without it ending up on a commercial read-only product; much information concerning music is passed along without the necessary involvement of paper. It is solely the third of the three, that is, virtual Internet-based music-making, that is still in its infancy, but it is growing rapidly.

Music Appreciation

For some, an investment in a CD is reasonably considerable. In some CD shops, one is provided with the opportunity to listen to certain CDs before purchasing them, but this is an exception, not the rule. Today, when purchasing many CDs, online listeners are often offered the chance to hear a number of tracks beforehand. More important, one need no longer think in terms of complete CDs unless that is the specific desire. Individual pieces can be purchased, be it in an encoded form that is currently not as high quality as CD audio.[10]

People who make noncommercial music are often allowing their works to be shared at low or even no cost whether it is downloaded from iTunes or its equivalent or from the artists' own Web sites or those of an organization with which they are affiliated. One can also listen to huge amounts of music on Web sites, including MySpace or YouTube (eventually involving visuals). Search engines can access music by way of the clever usage of keywords; they are particularly helpful when one is looking for a type of music, not a particular musician. This greater availability of information and the easier means to access information allow interested individuals the opportunity to discover and join evolving communities with relative ease and without great (or any) expense. Furthermore, one can listen in on an Internet performance or even participate in one. This is introduced under the discussion of music-making. Never wanting to miss a trick, stakeholders in the commercial sector, such as Amazon, have cleverly followed this trend by increasing the proportion of investment into lower-turnover items as well as independent labels and artists reflecting this widening of choice. This approach is known as the *long tail*, reflecting an image known to some probability distributions.

Even radio listening used to be limited to what was presented and when. Now, one can listen to most radio stations—and not just those that an antenna can receive—online, not to mention the plethora of new Internet broadcasters. Many of these offer a "listen anytime" option, allowing people to listen to music (or any other audio information) at their convenience. Internet broadcasters in general have a narrower focus than most radio stations, thus catering to a better-defined community of listeners. Again, greater information availability means greater access opportunities.

All of this has implied the possession of a computer with an Internet connection. Clearly, products based on our mobile technology are becoming increasingly sophisticated, so their role and that of new objects that are currently in the minds of their inventors will inevitably increase. There are entire urban areas that offer Wi-Fi. These developments mean that we will be able to access much of this information anytime, anywhere.

Information/Knowledge Related to Music

The arrival of the new millennium was by no means the starting point of any of the developments described here. Some technologies had been in development or simply less universally available for decades. Where music has witnessed some striking evolutions straddling century boundaries, the arrival of this new century

was perhaps more exciting due to the increase of the availability of music and music-related information than to stylistic change. What is evident in the first decade of the 21st century is threefold: the amount of information on offer has increased enormously, as have the means of sharing that information and the number of people sharing and benefiting from this evolution. For example, new forms of virtual communities were already evolving in the 1980s (see, e.g., Rhein-gold 2000).[11] A population thousands of times the size of the 1980s user groups now appreciates what was being developed at that time. Bulletin boards; online forums; information portals; wikis; blogs; multiuser domains, including social networking sites; personal, group, academic, and organization Web sites; as well as the music and music-making tools themselves can be found online.

We live in an era of lifelong as well as online learning.[12] Although not everything found online goes through the stringent peer review process of research publications, one can become aware of, gain access to, and eventually gain expertise in virtually any sort of music based on what is available digitally today and evolves from virtual communities sharing common musical interests.

Music-Making

The third aspect of our trilogy takes us one step further along the path from appreciation and understanding to creative involvement. This final area, as said, is relatively less developed than the other two but will inevitably gain in importance as our computer and other digital systems become more powerful and affordable. The fact that a sophisticated sound synthesis engine based on Csound is planned for the Massachusetts Institute of Technology (MIT) Media Lab's $100 laptop is just one indication of this inevitability.

Due to the emergence of Internet music-making (see, e.g., Vol. 24, issue 6, of *Contemporary Music Review* [2005], Barbosa 2003, Weinberg 2005), I have often suggested that a good deal of tomorrow's folk music is likely to take place online. New forms of distributed performance, many based on existent forms of music, are being developed or are already available. As technology advances, the ability to view others participating will increase; currently, most Internet music-making involves audio only and utilizes unique user interfaces.

Traditional forms of note-based music will continue to evolve as they always have. The addition of digital forms of music-making has simultaneously expanded the horizon of opportunities as well as supported those evolving distributed communities of interest.

Digital music-making on offer can be made in real time or non-real-time environments, can be note or sound based, and may involve single or multiple users. It may involve new forms of traditional instruments, new devices or interfaces evolving from these traditional instruments, or totally new types of instruments.[13] When music software is to be used, the new notions of freeware and shareware are more rule than exception these days, underscoring another form of

support for accessibility. Copyleft has joined copyright, aiding yet another form of music becoming accessible.[14]

The often-heard term *interactivity* is more than a trend. It is a word supporting human/machine and human/human (by way of a machine) musical communication. It has been responsible for the development of all sorts of potential musical tools.

Interactive sound installations represent an interesting example. They have rarely met with the same resistance that certain forms of contemporary music have faced. Perhaps this is due to the fact that, similar to an artwork, one can choose when to visit them and for how long. Regardless, such installations are a symbol of a major trend catalyzed by digital and, indeed, postdigital technologies, namely, the facilitation of new forms of participation. The firm boundary between "maker" and "taker" of music familiar to us through the culture of concert performance or broadcast and CD listening (but not most forms of folk music or music in club culture, where participation takes place by way of joining in the music or dancing) is being redefined. These new aspects of participation often lead to greater interest, eventually appreciation, and as a consequence, further desire to be involved with creativity in a given form of artistic endeavor.

In this section of the chapter, the naming of specific examples has been avoided as so much is rapidly evolving that readers of this volume in a few years would simply replace the examples with more recent ones with which they are acquainted. What is clear is that as digital technology evolves, our abilities to create and participate in communities based on musical interest evolve in parallel.[15] Given the information available in digital form, interested parties can discover music, musical knowledge, creative musical opportunities, and communities associated with all of these with relative ease. This is the information revolution that has moved so many of those marginalized experiments of the second half of the 20th century forward. As the number of Internet broadcasts and archives grow and are shared freely, the number of interested parties will grow in turn, thus leading to the most crowded "radio dial" in history. One need no longer tune into a radio station in the hope that at least something of one's liking is played but can tune into an Internet site with most of the repertoire of interest. As a consequence, one no longer speaks of the margins of music but instead of a new balance between the music born of industry and the music born of digital communities. This balance is, in my view, much healthier than the one created in the 20th century and more "natural," similar to those local communities that evolved in previous centuries.

One of the types of music to have reached a broader audience than during the period of marginalization is sound-based music. One reason for the broadening of the audience is that techniques related to this kind of music eased their way across the art/popular music divide during the late decades of the 20th century so that today new forms of music and music-making are evolving that are very much an art form of their own, often allowing people to create a bridge between their art and life.

3. SOUND-BASED MUSIC

Of the three revolutions presented in this chapter—technological (mechanical reproduction), musical (sound-based music often employing new technologies), and related to information (digital online communication)—the musical one is the focus of this final part. Thus, new or relatively new forms of music-making consisting primarily of sounds, not notes, are discussed. I treat this body of work as a case in point regarding drawing innovative forms of music out of isolation while creating new communities of interest and involvement. Sound organization ranges from forms of sound design for film and other artistic media, to sound art found in installations and galleries, to the broad spectrum of music that falls under the umbrella term *electroacoustic music*.[16] Sound organization can be heard in many computer games, advertisements, and some commercial television programs and films; it is not only an activity of the experimental new media arts. This being the case, most people will have been confronted with forms of sound-based music whether consciously or otherwise. Given the opportunities for making this exciting body of work available to people of all ages, perhaps demarginalizing things need not be so difficult after all.

A. Sound-Based Music: Reconnecting Life to Art

In this chapter, the notion of offering listeners things to hold on to was suggested. This can range from a tangible musical aspect to more emotion-derived experiences to the relationship between sound and image to something related to the listener's own life. Sound-based music offers the opportunity to relate art with life by way of employing sounds that the listener can associate with real-world experience. This particular point of view sits uncomfortably with one of the key notions of one of the great pioneers and theorists of musique concrète and the associated forms of sound-based music that followed it, Pierre Schaeffer. He was of the belief that the music he helped to found worked best when the listener followed a strategy of reduced listening (*écoute réduite*).[17] He believed that listening to a sound's quality led to a successful listening experience as opposed to paying attention to its source or cause. William W. Gaver spoke of a separation between musical listening and everyday listening, whether it concerns a work of musique concrète or a stroll in the countryside (1993). There is much to be said about the reduced listening strategy; much of it would be positive. However, in a chapter supporting access to sound-based music, this is not the best path to follow as people, in particular listeners new to forms of sound-based music, like to make links with their own aural experience, thus including links to real-world sounds if they are perceived.

Just like anything in life, being confronted with something entirely new can be challenging for people of all ages. In general, something must link that which is new with something that is familiar; alternatively, they should be provided with

something to hold on to in order to guide them into this new terrain. A research project with which I have been associated for some time, called the Intention/Reception project, has investigated just this sort of issue in terms of sound-based music while also looking into accessibility issues (see, e.g., Landy 2006, Weale 2006). What this research has demonstrated is that inexperienced listeners indeed do largely prefer to be offered things to hold on to, whether they are musical, related to sound sources and sonic contexts, or even a musician's intention. It has also demonstrated with some highly remarkable statistics that the potential audience for sound-based music is much larger than most people would imagine. Of the pieces chosen thus far, all of which make sonic references to the real world, some very directly, others most subtly, participants belonging to the inexperienced listeners' groups have consistently stated (between 59% and 80% of responses thus far) that they would like to hear another work of this sort in the future. The Intention/Reception methodology is called on in the discussion in this chapter of a planned curriculum for young people.

Sound-based music's content thus offers opportunities that are perhaps more evident than in note-based forms of music in terms of linking life to art and thus offering novel forms of access to new and innovative types of musical expression.[18] It is clear that the most difficult threshold in terms of any type of unknown music is the threshold of entrance. Once a person has discovered an interest in a type of music, a curiosity may develop to discover more about it and, eventually, participate in it. Given the new forms of access discussed in the second part of this chapter and everyone's association with sounds from the real world, various forms of sound-based music may offer fewer threshold challenges than other innovative forms of music. There are, of course, certain forms of sound-based music that are equally complex or unusual in the sense of their being removed from better-known forms of music, by which appreciation may be just as challenging as those types of note-based music for which access is not evident. Communities may form around these types of music, but not necessarily for newcomers; these are thus communities based on an acquired taste.

B. How These New Developments Are Being Reflected and Will Play an Increasing Role in Music Education

In fact, the threshold issue in terms of sound-based music need not be difficult at all as most young people today have access to digital games, many of which incorporate user-driven forms of algorithmic sound sequences. Almost every child who is provided with a user-friendly opportunity to make music with sounds, whether with simple daily objects or on a computer, is open to experiment and work creatively. Yet, most schools do not offer anything to do with this music yet.

Attempts to combat this state of affairs are taking place on several fronts, in particular by taking results such as those gained in the Intention/Reception project and using them as a lobbying tool so that people in education, commerce, and industry take this important information into account; by creating educational

tools for young people; and by writing new, more liberal and balanced music curricula reflecting the reality of today's musical communities.

As this book goes to press, two developments are ongoing that represent initiatives involving tools and curricula relevant to this discussion: the EARS (ElectroAcoustic Resource Site) Pedagogical project and a new UK curriculum for fourteen year olds in Music and Technology. These will now be presented briefly.

The EARS Pedagogical Project

The ElectroAcoustic Resource Site (EARS; www.ears.dmu.ac.uk) was born of the need to have a presence on the Web dealing with the terminology related to this body of work (and extended to cover all of sound-based music) as well as to serve as a means of finding information related to the subject of electroacoustic (and thus sound-based) music studies. This project has demonstrated its value given its high usage statistics and the support the project has received in terms of its internationalization, for example, its multilingual content, over the years.

What is more relevant to this discussion is a recent development within the EARS project, namely, the EARS Pedagogical project. This tripartite project was influenced by the Groupe de Recherches Musicales's CD-ROM, *La musique électroacoustique* (INA/GRM-Hyptique 2000).[19] This wonderfully produced French language publication is divided into three parts: listening, understanding, and doing. The same segmentation forms the basis of this new project. The Intention/Reception project's methodology, which supports sound-based music appreciation, is being updated to form the first of the three integrated parts of this educational project. EARS II, which initially will possess fewer terms than the current EARS, will employ definitions that can be understood by children (of age 10 and upward initially) or others with no subject-specific knowledge and, more importantly, will employ every aspect of hypermedia relevant to individual terms. EARS II will function as a tool for understanding concepts, whether they are historical, theoretical, or related to technological aspects. Users of all ages will be invited to try out concepts through interactive interfaces.[20] Sound and movie examples related to terms will be provided, as will hyperlinks for those interested in pursuing concepts further. A new software program called Sound Organiser is being developed in collaboration with the Groupe de Recherches Musicales in Paris that employs a strategy borrowed from computer games, namely, that of levels, in this case, learning levels. As an individual gains an ability related to a certain skill, he or she may progress to the next level, at which further opportunities are introduced. Challenges are presented to make the learning curve enjoyable. At higher levels, a distributed network version is envisioned for multiple users to make sound-based works in real time together wherever they happen to be.

An integrated curriculum will allow people learning by way of the EARS Pedagogical project to become introduced to new types of music as new concepts are presented and new forms of, for example, sound manipulation are included at the next level of the Sound Organiser. Once a certain level of expertise is gained,

users may decide to graduate to current less-user-friendly, but more "complete," software programs.

This project illustrates a holistic way of becoming acquainted with, learning concepts about, and being creatively involved with sound-based music. One can envision user groups for young people evolving with certain musical tendencies or involving certain themes. Art and life can certainly find new points of intersection in a socially innovative and culturally exciting new form of artistic endeavor that ideally will build bridges between people of all ages across the globe.[21]

An Alternative Music and Technology Curriculum

Music teacher and postgraduate student Alexis Ffrench was asked by a leading music examination company in Britain to write an alternative curriculum for schoolchildren. The invitation was due to the fact that he had criticized the current GCSE (General Certificate of Secondary Education) and A-level curricula (for ca. 14- to 16- and 16- to 18-year-old students, respectively) of a competing company as too traditional and too narrow. It is this last company's curricula that are being used by most schools in England and Wales currently. As this chapter was written (late 2007/early 2008), his proposed GCSE curriculum[22] was being tested in a small number of U.K. schools.

There are various revolutionary and refreshing aspects of this proposal, most of which are relevant to this text. First, it recognizes that people can achieve a high level of musicianship without being musically "literate" through the use of the five-line score. Ffrench's curriculum thus contains two paths, and the same high level of achievement can be attained in either. This being the case, Ffrench therefore recognized both aural and written musical traditions. In fact, he also recognized a third and more recent means of making music called the electroacoustic paradigm by François Delalande (2001) and my sound-based music paradigm by myself (Landy 2007b and introduced at greater length in 2007a). It is with this in mind that the curriculum is called Music and Technology and not just Music or Music Technology.

Ffrench believes in young people being introduced to the widest repertoire possible, including, for example, Black African, South and East Asian traditions, jazz, popular music, musical theater, and Western art music. He also introduces people to sound-based music in this curriculum through sections dealing with the soundscape and its associated field of acoustic communication as well as other forms of music employing new technologies. Students are not, of course, expected to achieve the same level of knowledge or musical expertise in all of these areas, but instead a basic awareness is expected, and following this, various studies leading toward specialization in one or more of these areas can be pursued.

If young people were to be presented with such a wealth of music and creative musical opportunities, their ability to make choices beyond those presented by the mass media would be enhanced. It is for this reason that one hopes that such curricula will be implemented in as many places as possible in the not too distant future. By introducing these students to sound-based music and opening curricula like this to readily available sound-based music tools such as those of the EARS

Pedagogical project, threshold issues will be dealt with in an early phase of these children's lives, and the opportunity to become involved in this form of music or any other will be made that much greater.

C. Sound-Based Music 4 All

This new century is going to be very exciting due to the revolutions related to digital communication. Book, journal, and music score publishers are all trying to figure out what their businesses will be like in a decade or two. The same can be said of our music recording industry, and broadcasting is redefining itself as well. For example, the transformation of the BBC in recent years in terms of its forms of Web-based communication has been massive.

All of this is going to lead to a much healthier map of music. For those interested in the music of sounds, a very dynamic future is predicted. When doing the research that led to my coining the term *sound-based music paradigm*, it became clear that an important wall previously segregating audiences of art and popular music was much less visible, that is, audible, and hence much less relevant when discussing the music of sounds.[23] A large portion of new media or digital art is innovative, and the innovative spirit found in sound-based music is shared by people who have roots in popular as well as art music traditions. The means of creating a work are largely shared, as is the technology and potential source material. Frankly, today some of the largest audible divisions in this body of music are those inherited from the past—the employment of a beat or not and a focus on noise textures, on loudness, on complexity; however, what appears in a given sound-based work need not place it as either popular or art music. Many such works are simply sound-based pieces.

That sound-based music can and will grow in the years ahead is clear as these tools become better known and become more accessible in developing countries and as education and means of broadcast and dissemination improve. People of all ages, abilities, and backgrounds will be able to share sounds and sound-based works as well as participate together in sound-based performance. It is already available to all, but many still are unaware of its existence. As tools evolve, education and dissemination improve, and new media arts become more widely embraced by society at large, communities will grow, and new ones will evolve. This is a far cry from the significant cold shoulder our cultures provided most forms of innovative musics not that long ago.

NOTES

1. See, for example, Landy 1990 and 1991 for two early discussions related to marginalization. Of course, I am not alone in this quest; an example of an important text on

this subject is the work of Duteutre (1995). A more optimistic view can be found in the 2007 work of Ross.

2. The term *sound-based music* was introduced in Landy 2007b and further developed in Landy 2007a and encompasses most electroacoustic music as well as sonic art and sound art. Terms associated with sound-based music include acousmatic music; soundscape composition; ambient music; sound-based electronic music; electronica (e.g., glitch, lowercase sound, noise music); sound-based formalized music; sound-based new performance (e.g., laptop music, new devices devised for sound-based music); sound art; sound installations; sound-based Internet music; turntablism; and a variety of forms of sound-based music rooted in experimental popular music, among others. Some authors prefer to separate sound design, sound art, and the like from music. Douglas Kahn described these tensions in his book *Noise Water Meat* (1999) and supported the view presented here that creative works focused on the organization of sound form a subset of music.

3. Jacques Attali's book *Noise* (1985) contains a post-Marcusian argument concerning the power of the industrialization of music and offers a foundation for any discussion concerning music's being evolved from its more traditional roles into a major commodity.

4. This is a number that might have been satisfying for folk musicians, but most of them would have been able to perform more often than most contemporary musicians.

5. Such ironic remarks do not restrict themselves to the past. In a recent music review concerning the Huddersfield Contemporary Music Festival, music critic Anna Picard wrote: "One could admire an audience that travels to hear music that many would travel equally far not to hear" (*Independent on Sunday*, December 2, 2007, p. 56).

6. France forms an exception with its rotation of baccalaureate exam pieces, including works by Jean-Claude Risset (electroacoustic) and Jimi Hendrix (experimental pop) over recent years. These works are, of course, introduced at the end of the study as one gains entrance into the music of today.

7. This elitism has been reduced in recent years due to some universities' outreach programs and others becoming involved with issues concerning accessibility issues related to innovative forms of music.

8. I am consciously avoiding the terms modernism and postmodernism here, as their usage, particularly in music, is too ambiguous for this discussion.

9. I introduced the phrase the *something to hold on to factor* in timbral music (Landy 1994).

10. The price comparison approach here is dangerous, of course. The sum of MP3 files on a downloaded CD could cost more than a 44.1k CD purchased as an object. There are therefore issues of quantity and sound quality here, but the fact remains that more music is accessible to a wider public than ever.

11. Nonlocalized communities have, of course, existed for a considerable period. Musicians interested in a certain type of music, for example, could share the same periodicals focused on their particular genre, meet at conferences and festivals, purchase the same recordings, and so on over most of the 20th century. The key differences with the virtual communities described here are the increased amount of information and the decreased amount of expenditure to access the information.

12. Even instrumental lessons and master classes are taking place now involving telepresence, but this is still an expensive and thus fairly inaccessible technology.

13. People associated with the Drake Project (www.drakemusicproject.org) have been involved with the creation of instruments for people with special needs, something they call "assistive music technology." This exemplifies how new technologies are making

music-making accessible to those who for whatever reason may not have been able or willing to make music previously.

14. Copyleft is the opposite of copyright, that is, the freeing of any rights related to the work in question. People can designate the level of rights related to their work these days. See, for example, creativecommons.org, accessed November 29, 2007.

15. It goes without saying that not all technological developments are a form of progress in the sense of moving an art form forward; many are not terribly useful, some may even take us backward. During our current Google epoch, we are very much a culture of "seek and ye shall find," and it is this that is being celebrated here.

16. A few remarks might be added here concerning where to draw the line between sound-based music and sounds that when organized are not music. I believe that this distinction is a personal one and prefer to avoid the discussion in the present text for that very reason.

17. For a definition of this term and to find resources related to this term, please refer to http://www.ears.dmu.ac.uk/spip.php?rubrique219, accessed November 29, 2007.

18. It is, of course, true that the live musician in note- or sound-based music is something to hold on to for the viewer, that is, as opposed to the case of CD listening. What is being addressed here is musical content; clearly, a good deal of contemporary note-based music is proving challenging to many listeners internationally.

19. Another initiative worthy of mention in the area of sound generation for young people is NOTAM's (Norwegian Network for Technology, Acoustics, and Music) software DSP. The most recent version can be found at http://www.notam02.no/DSP02/en/, accessed January 19, 2008.

20. A second, full-scale version for undergraduate students is currently in its planning phase.

21. Similar to the original EARS project, the intention is to offer all three aspects in as many languages and using as many local/regional sounds and music examples as possible. The latest articles related to EARS and Pedagogical EARS can be found at http://www.ears. dmu.ac.uk/spip.php?page=articleEars&id_article=3597, accessed November 29, 2007.

22. An A-level curriculum is proposed as a second phase of this development.

23. In Landy 2007a, several musical examples are presented to illustrate this conclusion. Artists such as Aphex Twin and Squarepusher may have roots in popular music, but some of their works could have been realized by someone with an art music background; the works are hard to place in traditional art versus pop categories. Many electronica works and pieces of noise music are equally difficult to place or simply reside in both due to certain aspects of their content. Furthermore, soundscape compositions often demonstrate little influence from either tradition. These and other examples support the notion of a sound-based music paradigm, a "supergenre" that takes aspects related to production, reception, and knowledge of this body of works into account.

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