
Deconstructing musical structure

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This paper addresses the overwhelming importance which computer music composers usually place on the structural elements of their music. It deconstructs the belief that the meaning of music lies within its structure. This represents only one half of the equation, while the other half embodies the notion that music is ultimately intended to be listened to by subjective human beings who will interpret the music in different ways. The meaning is not located in the musical object (the piece), nor is it exclusively in the mind of the perceiver (human), but rather lies in the relationship between the two. Furthermore, this paper proposes that there are no objective aspects of music at all. To support this claim, the author uses the latest research from neuroscience, cognitive psychology and neo-Darwinism. Analysing the pitfalls of the modernist world view and the structure-based music that it has produced, the author proposes postmodern methods for the survival of computer music. In order to do so this paper relies on Richard Dawkins' concept of cultural memes.

1. INTRODUCTION

When speaking about a piece of music it is a very common assumption, especially within academic music circles, to believe that the meaning of music lies within its structure. This is wrong, because it is only one half of the equation. The other half, which is usually and ignorantly neglected, embodies the notion that music is ultimately intended to be listened to by an audience. This group of listeners comprises subjective human beings who will make as many different interpretations of the music presented to them as there are individuals in the audience. Human response to the structural elements which organise given musical sounds into a sonic entity is important, but is definitely not the only player in the process of making musical meaning. The meaning is not located in the musical object (the piece), nor is it exclusively in the mind of the human perceiver, but rather lies in the relationship between the two. In the following discourse I would like to concentrate on this semiotic transaction in an attempt to deconstruct the tremendous importance generally ascribed to micro- and macro-musical structures when composing music. In order to do so, I must first explain the origins of meaning and its subjectivity.

2. MAKING MEANING

To produce meaning it is necessary to have a conscious human being interacting with an environment. This human being, unless raised in a deprivation chamber, is going to be loaded with a myriad of subjective life experiences. Humans categorise 'good' and 'bad' experiences based on their interactions with the environment and their ability to detect, memorise and compare an exponentially growing repertoire of new good and bad things. Most human intentions are based on these subjective experiences.

The home of our conscious subjectivity is the cerebral cortex – the last part of the brain to evolve. This is the part that produces consciousness and that we are most proud of, because it can make complex decisions, create language, write music, play chess and think of black holes – which no other animal can do. Unlike other animals, humans are born with only twenty-five per cent of their adult brain weight, and the brain's final development has therefore to be completed after birth. Though the human genome specifies in great detail the construction of the human body, vast numbers of the brain's circuits are not pre-set by the genes and are formed later in life. Since every human being's history and circumstances are different, each brain's wiring is going to be quite unique. Humans are born with a brain endowed with automatic survival mechanisms which adapt to work in an array of socially permissible decision-making strategies. The nurturing conditions under which the brain finishes its development are shaped by a culture that conforms to a 'socially agreed' set of values. Educating the brain within such a system of social organisation should guarantee the survival of that cultural group (species) within the given environment.

Hypothetically, if the *mores* of the cultural environment do not prescribe the practice of music, these survival mechanisms would certainly guide one to become nonmusical. If Mozart had been born in this kind of environment, in spite of his genome outline, he might have preferred being a carpenter rather than a musician.

We must also be aware that not all operations of the brain occur at a conscious level; awareness starts

when we consciously focus on a point of interest. Here, I would like to concentrate on consciousness involving very short-term memory, which is closely associated with attention. Attention is, as William James said, 'withdrawal from some things in order to deal effectively with others'. In general, attention and primary consciousness involve some kind of bottleneck. At first, the brain processes the vast amounts of incoming information in parallel. Then the selective attention of hearing, for example, concentrates on one or a few objects at a time using the serial processing of the bottleneck – attending to one object after another. This is done by temporarily focusing on the objects of our interest while filtering out unattended information (Crick 1994), much like listening to a Bach fugue while focusing our attention on the thematic workings of the dux and comes.

We may assume that primary consciousness of short-term memory deals with attention which is value-free perceptual categorisation. This takes place *before* perceptual events contribute further to the alteration of neuronally structured and experience-shaped value-dominated long-term memory. When short-term memory starts to contribute to the modification of subjective long-term memory (this could be called a learning process), events are no longer in the remembered present, i.e. they are no longer in primary consciousness (Edelman 1992).

Primary consciousness is required for the evolution of higher-order consciousness. But limited to a small memorial interval around a time chunk I call the present. It lacks an explicit notion or a concept of personal self, and it does not afford the ability to model the past or the future as part of correlated scene. (Edelman 1992)

MUSICAL EXPERIENCES

Now, just for the sake of experiment, let us assume for a moment that under the same external environmental circumstances, for me to perceive a middle C, certain groups of neurons and molecules in my head must behave in a very specific way. If the neural correlate of middle C in your head is exactly the same as in mine, which we know is probably not true, we may conclude that you hear middle C the same way I do. Stating this, we inevitably run into a problem with 'exactly'. The word 'exactly' functions properly only in mathematics: $1 + 1 = 2$. On the abstract level, 'exactly' makes perfect sense, but in the practical world of everyday living, nothing is exactly precise. Moving further on, if we consider a major scale, things get considerably more obscure. When the brain receives sequences of musical tones, it does what it does with other patterns: it attempts to 'interpret' them by using the information stored in its long-term memory about previous, similar experiences.

This information may allow some aspects of a future signal to be anticipated – as happens when we hear the first line of a familiar song. This ability to extrapolate forwards on the basis of past experience is one form of that ability that we call 'intelligence'; it can dramatically enhance an organism's chances of survival. Thus, if my neural correlate of middle C depends on my past experiences, which we assume is true, then my neural correlate for a major scale is going to have totally different wiring from yours. My past musical experiences have grossly influenced my neural mapping which correlates in my brain with the concept of a major scale. 'We constantly judge by comparison, and our judgment of any item depends upon what we are comparing it to at that moment.' (Ornstein 1986)

In addressing past experiences we also have to consider the way our brain handles long-term memory. These memories are not stored in the brain photographically as intact individual events; and there are no stores of audio tapes, or albums of pictures. This is completely unlike computer-based memory which deals with exact reproductions. Human brains operate with a reconstructed version of the original – an interpretation. In order to compile a musical tune, the brain has to fire a certain set of neural mappings as a means to paraphrase 'the music'. These firing patterns trigger the momentary reconstruction of an *approximate* representation of *The Star Spangled Banner*, for example. Your interpretation of music today depends on: who you are, what you are doing at that moment, and your past experiences stored in the long-term memory. But, the next day, you are going to be different, what you will be doing is going to be different, and your past experiences in long-term memory will change as well.

The 'mass of soothing sound' your mother made while singing lullabies to you in childhood is reduced to *Twinkle, Twinkle Little Star* later on in life. Our memory of a certain musical piece is influenced not only by previous knowledge but also by events that happen between the time an event is perceived and the time it is recalled (Ornstein 1991). Furthermore, we can only recall memories that are related to our present situation – where you are and what are you doing. If you are composing an orchestral piece, your brain more likely focuses on recalling memories related to the instrumental ranges, rather than memories of how to change a flat tyre on your car.

So our memories, as exact, recorded, fixed images of the past, are an illusion. We believe we are stable, but this is one of the built-in illusions of the mental system. We believe we remember specific events, surely. Yet we don't. We make them up 'on the fly'. We change our minds all the time, from our estimate of the odds on a bet, to how we view our future. And

we are unaware that the mind is doing this (Ornstein 1991).

All this is pointing out that the human mind deals exclusively with subjective phenomena, and what we call objective is nothing but what most people agree to at the given historical moment using accepted scientific paradigms within a given sociocultural context. Yes, we may listen to Beethoven's symphony in terms of air-pressure waves and on that level probably most people would have similar experiences. The question is, what is the use of doing that? Well, this is the question humans have wrestled with for centuries. Sound waves are more 'objective' and easy to define, while human responses are subjective and multifaceted.

4. STRUCTURAL PERFECTION

Human obsession with objective perfection has a long and sullen history. From the early beginnings of scientific treatment of music by the ancient Greeks, who derived Greater and Lesser Perfect Systems of musical intervals, long-desired aural perfection has never been achieved. It is not by chance that musicians, being far more interested in formal theory of musical structure, seldom talk about the meaning of musical content. From a different angle, the history of western music can be perceived as a series of failed attempts in achieving absolute formal perfection as a bridge to transcendental purity and personal redemption.

It would be silly to blame Plato, who lived 400 years B.C., for believing that various types of musical scales produced an automatic subconscious process which, in turn and with great precision, were capable of modifying a listener's behaviour. Two millennia later, were Boulez, Babbitt, Xenakis, LaMonte Young and Cage essentially any different in a philosophical sense? All of them held to the modernist music idea, that objective musical perfection can transcendently affect the listener. Yet they are so similar to Plato in their musical undertaking. These modern composers either attempted to create 'the perfect structure' using various methods of extreme complexification such as total serialism, pitch set manipulations, mathematical permutations, etc., or they searched for purity by stripping the structure to the basic elements of sound such as the perfect fifth 'to be held for long time'. John Cage, as always, makes a unique case in his endeavours for perfection through indeterminacy and chance – which he believed operates unpredictably and transcendently as does nature. It is easy to see *how* modernist composers struggled to improve their formal structures, getting closer and closer to ultimate purity, but it is not easy to see *why*.

Achieving ultimate purity has always been very important to humans. By cleansing the world around them, purging it from evil and dirtiness, humans hoped to qualify themselves for eternal life. Human effort reflects this urge toward perfection, the striving for immortality. The body was the first thing on this superhighway to purity, which had to be abandoned. Next came the real world with its imperfections. Ernest Becker makes this argument vividly clear pointing out that humans 'are truly sorry creatures because they have made death conscious' and, therefore, they have 'to transcend the limitations of the human condition and achieve victory over impotence and finitude' (Becker 1975). People like to surpass their physical fate in the perishable world of flesh and blood, devising a 'nonsensible project' that would assure immortality in a spiritual rather than physical way. Through this transference humans try to overcome what Freud defined as 'fear of self-knowledge', realising that what they are is nothing but frightened creatures conscious of their limitations. I am not quite sure that the above-mentioned composers were able to see their artistic activities from this perspective; because if they did, they would have realised the implausibility of their efforts.

No wonder that these various perfection strategies, applied to the field of music, never generated any important human response. These composers treated music as a stand-alone object of absolute value. They seemed to ask, 'Why base quality of music on cultural response?', which represents no absolute categories but rather contains subjective properties of the dirty world filled with nonperfection, death and impermanence. The conviction that music, which has structural quality and is close to some imaginary perfection, affects the listener transcendently, is not that far from Plato's ancient belief. The living proof that the whole idea of purity in music was an embarrassing failure lies in its manifest lack of communication with audiences.

Surely these composers must have cared whether the audience listened. Milton Babbitt's 1958 article *Who Cares if You Listen?* clearly exemplifies the core of the problem. Babbitt was lamenting how the 'general public is largely unaware and uninterested in' contemporary music. If we suppose that this paper is written in Klingon instead of English, you would then be expected to make an effort to understand it. But, would you do it? Of course not! Thus, as a writer, I can blame *your* ignorance for the miscommunication in getting my message across. This logic makes no sense at all. On what grounds may one suppose that the public is going to be *largely* interested in anything or anybody who is not, in return, interested in the public interest? It should have been understandable to Babbitt why the public is much more appreciative of a car mechanic at a muffler

repair shop than of a mechanical engineer with a PhD at NASA. The former is not more important than the latter, but because in the everyday world where ordinary people live and work, it is much easier to experience the benefits of having a muffler replaced than the benefits of the ingenious construction and design of the launching pad for the space shuttle. Perhaps we need more composers who get a bit more musical 'grease' on their compositional hands.

5. THE FUTURE OF COMPUTER MUSIC

Now, when I see an electronic music composer who, in making a piece of music is primarily focused on its internal structure with its use of fractals, Fibonacci numbers, solar systems, palindromes, permutations, interpolations, pitch-sets, algorithms, timbral manipulations, etc. etc., and less concentrated on how the cultural environment reacts to it, I get worried about the future of such music.

Why is understanding of a human culture so important? Intelligence and a culture are co-requisites for each other. What makes the primary difference between our species and all others is our reliance on *cultural* transmission of information, and hence on cultural evolution. Animals do interchange information within a biological rather than a cultural context. Bird mating calls certainly fall under the category of sonically transmitted information which is specific to a given species, but those species have no intelligence and undoubtedly no bird-culture. This does not mean that animals have no minds, it simply means that *by human standards* those 'primitive' minds produce no intelligent culture.

Dawkins' meme has a peculiar but powerful role to play in our understanding of the human culture. This is the way he defines it:

Examples of memes are tunes, ideas, catch-phrases, clothes fashions, ways of making pots or of building arches. Just as genes propagate themselves in the gene pool by leaping from body to body via sperm or eggs, so memes propagate themselves in the meme pool by leaping from brain to brain via a process which, in the broadest sense, can be called imitation. If a scientist hears, or reads about, a good idea, he passes it on to his colleagues and students. He mentions it in his articles and his lectures. If the idea catches on, it can be said to propagate itself, spreading from brain to brain. (Dawkins 1976)

The important rule for memes, as for genes, is that they must constantly replicate. This replication is a mindless process not necessarily for the good of anything; replicators flourish that are good at replicating – for whatever reason. Meme X spreads among the people because X is a good replicator

(Dennett 1995). Let's take a moment and look at the case of one particular meme – the success of a four-note meme at the beginning of Beethoven's Fifth Symphony. It certainly has little to do with a pitch-set of its 'internal' design, i.e. the way a musical piece is compositionally structured, but much more to do with the design this meme presents to the world, its *phenotype*, the way it affects the minds and other memes in its sociocultural environment. What computer music composers should be concerned about is the memetic future of their music. Unfortunately, computer music memes are not replicating and spreading themselves much further than narrow technically specialised audiences. On the contrary, instead of orienting themselves to the cultural response, composers are getting more and more interested in obscure aspects of their music.

6. ESOTERIC MUSICAL STRUCTURES

A belief that musical meaning lies exclusively within the musical object is best exemplified through the applications of computer models of complexity theory to musical structure. Pushing the compositional system out of equilibrium to the very edge between order and chaos is rich only in possibilities. Assuming that 'creativity is balanced at this knife edge between predictability and randomness' (Jencks 1995) is wrong. All that results is something new and beyond quality control. If, as we already know, complexity is dumb and mindless as universal law, then human-edited musical structure based on such a complexity cannot be otherwise. It is an illusion to believe that music constructed in this way works beyond cultural boundaries at the level of transcendental communication. It should always be kept in mind that the complexity of sound structure's emergent behaviour is amoral and has no intrinsic value. It may result in something new and innovative but may also be a blatant bore to the musical audience.

This problem can be viewed through Einstein's absolute misstatement that the 'universe is a friendly place' (for whom?). This premise is feasible only in relation to the thinking that humans have more rights on this planet than, say, the AIDS virus. But do they? How about an asteroid which, as a result of some emergent behaviour of cosmic proportions, wipes out all life on the Earth tomorrow – can we believe that the universe would really care about it? Imagine the question from the universe's point of view: does it make any difference for the universe if Mars or the Earth disappears? As far as we know at this historical moment, the universe would just mind its own business and keep on expanding into the next emergent innovation. For innovation to be considered creative, we need a viable context, an ecosystem to whose wellbeing this innovation will contribute. Thus,

rather than struggling to incorporate these new scientific findings into the structure of our electronic music, it would be better to concentrate on the environment that can understand our 'masterpieces'. Music needs to operate within human reach, not within a chancy hypercomplexity.

So, what is the environment in which our music exists, and how do we conclude whether its contribution is positive or negative? This is the question with which composers ought to be concerned. Switching contexts, how do we figure out what is good and what is bad food? We look for response and, based on that response, we draw conclusions. Eating greasy cheeseburgers often would certainly raise my cholesterol level and, in the long run, I may end up having a heart attack. Conversely, if I release my music into the public arena of my environment (this obviously *does not* include a few computer music specialists) and get no positive response or audience interest, I probably would fall into the category of esoteric innovator rather than pertinent creator. Let me try to clarify the difference between creation and innovation using a biological analogy.

7. WHAT IS CREATIVITY?

The human body is an amazing living system intricately designed to survive in its environment. One day a new virus penetrates the body and threatens the stability of the entire system; alarms go off and differentiated lymphocytes (one type of white blood cell) approach the virus in order to figure out its makeup. Browsing at the speed of light through the enormous database of previously produced antibodies, these lymphocytes find out that they have never before encountered this particular viral strain. Then, quickly, the undifferentiated lymphocytes rush to read the genetic code of the unknown virus. Using this information the lymphocytes mature and become differentiated, changing their identities so that their genetic code matches the code of the unknown virus. Now, ready for the fierce battle, these new lymphocytes start to multiply as fast as they can. Each new lymphocyte produces a deadly antibody protein which kills the virus, saving the social order of the organism. Concluding the transaction, the lymphocytes memorise this viral genetic code and store it in their database, in case of eventual need in the future. The ecological day – and long-term organismic gratification – has been won!

On another day, one of the body's delicate parts, a single living cell, turns out to be a self-expressive innovator, although no one knows exactly why, and changes its social function – decides not to die at all. Therefore, instead of vanishing at the end of its lifetime, it starts to multiply, producing more and more innovative siblings. This geometrically progressing,

separatist growth has no concern for the societal coexistence of its constructive elements. It functions egocentrically and with self-indulgence, destroying everything in its path. Cutting and ravaging the other surrounding cells and tissues, this antisocial cancer grows until it reaches a point where it can expand no more. At this instance, the delicate social organisation of the original system – the human body – is so disturbed that it cannot function as a whole any longer; it has to collapse and die, killing itself and the cancer. The ecological day has been lost!

You may wonder how all this relates to computer music. Let me explain. Computer music, tightly linked to technology and its development, became one of the biggest proponents of modernism and the musical avant-garde. The question arose: was this music innovative or creative? There are several ways of answering this, but let me use my biological analogy once more. In both cases mentioned earlier, the changes made within the cells rendered specific responses from the organism. It was not the change or the single action taken by the changed cells that made it into a good or bad choice; it was the complexity of responses and transactional ecology generated by the components of the holistic system. Quality does not exist in the cell nor in any singular component of a living system; it is rooted in the transactions among them within their existential context. Similarly, computer music artefacts cannot be analysed apart from responses made by the environment in which they are presented. If there is to be an evaluation, it has to come from the quality of the transaction which includes not only the musical configuration but its cultural response as well.

8. GLOBAL VERSUS SPECIALISED

By now, we may assume that the most common function of music is its attempt to communicate – to present a body of aural information which may eventually be understood and embraced by society. How does that work? Have you ever wondered why a funeral march from the Chinese culture does not sound to western ears like anything even remotely mournful? That happens because the funeral music is sound organised into culturally understood patterns unique to the Chinese. Musical sounds *per se* are certainly meaningless, because music cannot express anything extra-musical, unless the association to which it refers already exists in the minds of the listeners. There is no way to convey any meaning if there is no common redundant ground of socially shared experiences and responses. I would venture to say that almost all of us agree that music when placed in a public arena is primarily about communication between a composer and the audience. The question

thus becomes: should my intention ‘have larger orientation: the universe as a whole’ (Jencks 1995), addressing a community of intergalactic proportions where the complexity of emergent structures is commonly understandable, or should I present my music to a community of interested inhabitants on planet Earth?

How big, after all, does community have to be in order to be manageable for successful interaction? This can be answered by another question: what size is the audience that understands your ‘language’ of communication? Nicholas Negroponte predicts that ‘we will socialise in digital neighborhoods in which physical space will be irrelevant and time will play a different role’ (Negroponte 1995). However, what he misses is that the primary focus of socialising on the Net is not only transcendence of space and time but, most importantly, the transcendence of the body. To paraphrase Marshall McLuhan, ‘technology is the extension of human powers’, and what we see today is that ‘technological prostheses had begun to ‘liberate’ us from the limitations of the human body’ (Slouka 1995). Cyberspace is being tilted as a hyper-real simulacrum intended to be pure, clean and spotless – providing us an escape from the real world (already demoted by the Net’s digerati to the acronym RL) as being ‘boundless in its difficulties’ (Borgmann 1992). Luckily, there is more and more ‘dirt’ being introduced to the Net every day, and in the end it may become as complicated and difficult as real life. This is the reason why ‘the biggest difference between horses and cars’, as Keith Hensen points out, ‘is that cars don’t need attention every day and horses do’ (Kelly 1994). In other words, silicon-based machines are supposed to work infallibly, while carbon-based ones fail almost every day. One could well ask at this point why are humans so unhappy about the shortcomings of life and the body and such big suckers for pseudo-perfection?

9. HYPERMODERN LIVING

What I am trying to stress here is that as long as there are composers – or, for that matter, any artists – who exclusively concentrate on esoteric structurally based subjects and do not address the human condition in the real world, communication with their audience is going to be very difficult. What makes this problem even more complicated is the present condition of our culture, exponentially driven by desire for progress via technology, which is producing historically unprecedented complexity and contradiction among its structural elements. Building denser and denser data highways, hypermodern people are confronted with a glut of information which forces them to make one of two choices. (i) They can metabiologically cause excessive stress to themselves by attempting to digest

all incoming data – a suicidal quest. The amount of information in a single issue of *The New York Times* contains more data than a person who lived 400 years ago had to process in an entire lifetime. Or, (ii) in order to escape this general information overload, people can resort to a tunnel vision that concentrates on an unbelievably narrow window of highly specialised interests. Such individuals are learning more and more about less and less, leaving out of the equation any semblance of a holistic understanding of how their speciality fits into the rest of existence. They soon discover that they are not living their life; their speciality is living them, and the result is an iconoclastic insanity. Neither of these choices offers an attractive life strategy, but, out of sheer informational desperation, more and more people are opting for the second alternative. Of course, these hypermodern specialists have lost touch with the common base of humanity in pursuit of their own unconnected obsessions. T. S. Eliot, in commenting on Dante’s *Inferno*, describes Hell as some place where nothing connects with nothing. Sounds familiar?

Does the above mirror what we are doing in our computer music world? It really *does* if we choose to have a hypermodern lifestyle that aborts all possibility of dwelling sanely within the limitations of the body. Look at the Internet – or even computer music conferences – where we are exchanging primarily technical information. Or examine electronic music education, which focuses mainly on teaching computer software. Are we losing touch with our common base – music as a service-oriented art? It is perfectly all right to exchange among ourselves the technical information about the make-up of our music but, in the end, to paraphrase Gertrude Stern, a sound is a sound is a sound. No audience would particularly care to find out all the peculiarities of our highly specialised software, nor would that information bear any significance in their interpretation of our music. Perhaps we should stop making music exclusively for ourselves and look at the world outside our own narrow niche, in order to understand where we came from, and where and how we want to go. If we want our music culturally to survive we may look at biology again, and it is not going to be ‘difficult to see that a species would not survive without a “built-in” sense of responsibility both for self and for others of the species’ (Salk 1972). What is the prospect of achieving this important task?

10. POSTMODERN LIVING

What we need are composers willing to give up chasing perfection in the narrow realm of highly specialised perfection and, instead, address the problem of communicating with real and imperfect human beings – and finding the most efficient way to do so.

We need a new approach. The first step toward this new approach should be focusing on small neighbourhoods, on communities that try to understand us even as we strive to understand them, communities of *common people* that we care about and with whom we want to share some common emotions and experiences. We should educate ourselves globally, learning on the large scale all the peculiarities of the universe that we possibly can, as well as on the small scale all the intricacies of the subatomic particles; but our efforts for musical communication ought to be directed locally on the human level. As Kevin Kelly says: 'Where there is an ecosystem, there are local experts. An outsider can muddle through an unfamiliar wilderness at some level, but to thrive or to survive a crisis, he'll require local expertise.' (Kelly 1994) In these small neighbourhoods, we may be able to concentrate on what Lyotard calls 'small narratives', or things that are valuable and useful to local populations. If we lose our local context, which is the only context within which we can physically dwell, we may immerse ourselves into an utterly amoral universe. We should beware of the 'global village' as well as 'highly specialised villages', concepts which are evolving away from the locally defined, individual nature, toward a collective hive-mind of the mass self. In such an environment, there is no concern for individuals or the music that they produce; communication becomes a noncontrollable, unpredictable, nonunderstandable and self-organising amoral complexity.

We must understand that the 'Information Age' should represent 'quality, not the quantity of information' (Jencks 1995), and in that light we ought to use our knowledge acquired on the large and small scales. As we look at the musical world of modernity, we can see that it has been moving, for the most part, according to complexity theory. Composers composed an avalanche of musical pieces that relate more to each other than to the common human condition. One innovation followed another to infinitude, just like mindless and purposeless emergent products. We can decisively conclude that complexity may be a law that governs the universe, but at the same time a law which humans must defy. The reason is best described in Becker's words: 'the tragedy of evolution is that it created a limited animal with unlimited horizons' (Becker 1975), making us already an exception to the rule. The humans have a mind and the wisdom which 'implies making judgments in advance rather than retrospectively' (Salk 1973). Evolution does not have a mind. Thus, we may as well stay on this divergent evolutionary path and start caring *and* communicating with each other rather than succumbing to the powers of mindless complexity that innovated us.

There may be a promise in postmodernism and in the possibility of culture arriving at the hyperconscious state, in which creative wisdom begins to

replace innovative complexity. Holistic, environmentally concerned creation must take precedence over separatistic self-expression; both/and continua must take priority over either/or polarities. 'Post-modernism means the end of a single world view and, by extension, "a war on totality", a resistance to single explanations, a respect for the difference and a celebration of the regional, local, and particular.' (Jencks 1992) Is the task which emerges utopian and impossible to achieve? Recently, a TV commercial advertised computers made by DIGITAL whose slogan stated: 'Man has an increasing appetite for more and more.' They are right, if one assumes that humans follow only their instinct for instant gratification. Postmodern hyperconsciousness, which demands a disciplined slowdown, is as difficult to attain as it is to convince the public of the importance of appetite control and staying on a healthy diet. So, what do we – composers of computer music – have to do? Slow down and make sure that the amount of time we spend on figuring out new software is accompanied by an equal amount of time spent studying philosophy and aesthetics, not only in the field of music but equally in the other arts and sciences. This slowdown does not necessarily mean a quantitative change but rather a qualitative one. On the contrary, the amount of work we may be required to perform can actually increase; what would change is the focus of our efforts. We should not be attempting to bite off a single piece of innovative information that cannot be chewed and carefully digested. More time ought to be spent studying and attempting to understand the transaction between computer music and its social environment. We have to educate ourselves broadly about the various aspects of our own and other cultures, if we want to convey and share common experiences. Without this mutual understanding no communication is possible. Only connect . . . the rest is silence.

11. POSTMODERN MUSIC

So, what are the strategies for breaking this silence in communication we created among ourselves and our audiences? The primal concept of 'bricolage' (Levi-Strauss 1970) is one of the strategies which postmodern culture may use for action. Bricolage is an assortment of a finite number of thoroughly understood, but limited means, for solving a large number of diverse problems. A common illustration of this concept might be the handyman who comes to your house to repair something, and innovatively and comprehensively uses the same bricolage of tools regardless of the difficulty. No matter how technologically sophisticated society may be, its subjects still operate within the bricolages assembled through personal knowledge and intelligence. Most important for

postmodernists is to realise the scope of one's bricolage in proportion to the scope of the musical problem before them. Global or highly specialised proportions, versus local neighbourhoods.

In order to successfully communicate with an audience, we have to rely on the redundancies already proven to work within the small neighbourhoods. One of the most important general characteristics of postmodern musical configurations is the new use of old music. The musical information already known and previously digested by the public is presented again in new constellations. Postmodernists regard the unassimilated past as much a partner in musical creation as the yet-to-be-explored future. Therefore, postmodernism has no absolute canon related to proportion and beauty; it regards all historical styles and strategies as equally viable options in solving contextual aesthetic problems. By eclectically selecting, not only from the past but from the diverse nonwestern worlds of music as well, by collapsing the differences among high, middle and low cultures, postmodernism, always with its neighbourhood in mind, produces fresh and interesting musical constellations. This collage of divergent cultural levels may often carry more than one possible interpretive meaning; these meanings are double coded and are configurations fraught with potential for parody, pastiche and irony. When combined, all these characteristics invariably produce products that are disjunct and discontinuous – which is not to say that they are similar to a disjunctness and discontinuity often associated with musical innovations of the avant-garde. If there is a single negative point about the avant-garde in music, then it is the use of discontinuity and disjunctness without any historical or compositional reflexivity. This music has been obsessed with one unconnected novelty after another, never going back and re-evaluating what has gone before in relation to what is going on now. Being aware of this perceptual problem, postmodernists repeatedly use reflexivity as one of the most important features in their work and their compositions. This reflective concern also

requires the postmodern computer music composer to study extensively the ideational redundancies embedded in the culture. More importantly, the composer has to find ways of clearly explaining to the intended audience the intentions of the musical compositions and the necessity of engaging the designated public in musical disjunctness with an active, reflective perception. No reflexivity in the contemporary composer's cultural matrix, or no reflexive intentions and intellect in the contemporary listener – no connection, and no music!

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