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Contemporary Music Making and Developing an Ecological Consciousness

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The Problem and Setting

We are listening to a familiar and much loved piece of music, relaxing into its sonorous tones. The mystery of the blend of rhythms and harmonies is transporting. In rapture we may imagine a concert hall with full orchestra on stage, all black and white with intense faces and gleaming instruments; or perhaps a more intimate space wherein a pianist weaves her magic, as glorious sounds emerge through her rippling fingers, her whole body intense, seemingly "at one" with the Busendorfer. Certainly our imagination can bring us very close to the reality of a performance.

The richness of our enjoyment of music, I suggest, is thoroughly bound up with such cultural interweavings. We are curious about the conductor, the orchestra that played and the occasion of this performance. Therefore, it would be appalling to later discover that this "music" has been produced by a skilled technician using a music synthesizer. This music results from a process by which sounds have been reduced to precisely defined mathematical abstractions and electronic impulses which have been regenerated through means of some very sophisticated technological hardware. Leaving aside the not insignificant implications of listening to recorded music, via the technologies involved in compact disk, audio tape and record reproduction, how does this leave us feeling about our music?

For many people, knowledge of such a synthetic genesis of the music brings a feeling of emptiness: of being cheated or "conned".

Why do we feel cheated? Is this merely because the technology enabling such "electronic" music is new; currently in transition in our cultural setting, and that soon it will be so much an accepted part, that it will not matter? Or are there deeper, more significant reasons for concern?

My contention is that these concerns are of immense significance if we as human beings are to live reflectively and responsibly in our world.

However, I am not taking an across the board anti-technology position. Rather, I am saying, let us consider our technologies for what they are; for how they effect us and our way of being in our world. Let us not just swim along with innovations as they come. Is this the only direction our society can move in?

As a pianist my thinking around these issues arose from my exposure to "piano like" innovations. While I really enjoy the piano - the sound of it, playing it, using it to make

music with others, I have feelings of discomfort about electronic pianos, keyboards and synthesizers. My interest in exploring more deeply why I feel this way, has been germane to the writing of this article.

While I will be discussing the piano in relation to technological innovations producing piano-like instruments, much of what follows can be applied more generally to computer generated music.

Essentially my concerns emerge from a much broader interest, covering concern for how we perceive life to be, how music and more specifically, how the technology involved in these musical innovations both reflects and shapes our perceptions of life.

Through its role in shaping and reflecting cultural perceptions, attitudes and understandings, music in turn, determines how we perceive relationships between people and the environment.

The Perspective of This Critique: Music and an Ecological Consciousness

I see the environmental crisis as predominantly a crisis in consciousness, a crisis which has been brought about through the particular ways our society has conceptualized life; the relationships between people and all other aspects of the environment; the priorities we make in our life; how we have literally "built" our world. It is evident that our present western society is characterized by (an emphasis on technological) mastery of the earth. This view embodies the concept of objectivity, whereby people are seen to be separate from nature (or the rest of Creation) and each other. It also embodies an hierarchical understanding with people conceived of as being dominant over Creation and this attitude is then mirrored in situations throughout our society (as in domination of men over women, managers over workers, and so on). This has led to a situation where in our western world, our technological mastery, while giving an illusion of mastery over our environment, is actually involved in generating unforeseen and essentially unknowable effects on our environment, often with disastrous results.

The awareness of the ways in which we have "built" our world lead to the understanding that our world or reality is not just 'a given' (that is an external reality having an objective existence which we can master) nor is it a construction of consciousness (as in solipsism, which expouses the idea that the thoughts and feelings of each person construct an individual mental world, which is thought to be the primary reality) but that the world and language (or our perceptions) go together to reveal our known reality. So we can say that the way in which we make contact with, and describe our world, is how it then reveals itself to us. Language as the means by which we describe our world refers not only to our use of words to communicate and shape our perceptions, but to all the communicative activities we as people engage in including our communication through the arts, our technologies and our music. I take the perspective that our 'doing' is our 'being'. The instruments that we invent and use reflect our attitudes, shape our attitudes, are our attitudes.

Furthermore, it is our modern technological consciousness that actually constructs our current awareness and understanding of there being an environmental crisis. It is only via our complex technologies that it has been possible to be aware of the present ecological concerns such as the hole in the ozone layer, or the temperature rises associated with the "greenhouse effect" The outward development of technology finally turns inward upon itself and reaches a stage of self-consciousness and comprehension of its own essence and characteristics.

Thus, our present ways of thinking and acting have brought us to a place where we now

recognize that we are embedded in interlocking environmental and social dislocation or problems. Our understanding of our "world" as material and biological phenomena observable to our senses has come into being through our "intellect" our thoughts, beliefs, memories and so on. To what extent do recent piano-like electronic innovations encourage an attitude of mastery over nature? Or, to what extent do these innovations frustrate the development of a new vision of connectedness between humanity and the rest of nature?

The application of technology is too often seen as a solution to environmental concerns. The technology itself however, may postpone the development of new connections between people and creation (nature).

Whether or not these technological innovations in music in time are to become a transparent and unobtrusive part of human culture, my plea is that we pause and consider the potential influence of such technologies; their potential to influence our perceptions of the relationships between ourselves and the rest of nature or creation.

The philosopher, Martin Heidegger, has talked about the possibility of a different attitude towards the world, a sense of being-in-the-world which implies a thoughtful and concernful attitude towards the world. It is an attitude of 'letting things be', and would entail an 'ecologically harmonious sense of self' (Shepard, 1982) a new consciousness whereby we see 'care of nature as care of self'. But he also makes this assertion that only through a true consideration of our technological world can we come to find what he calls the 'saving' power' which will allow us to develop such an authentic way of being-in-the-world.

> "Thus the coming to presence of technology harbours in itself what we least suspect, the possible arising of the saving power".

Technology and It's Significance

Technology for the purpose of this article, is understood to refer to the whole realm of artifacts that emerge with societies The essence of these artifacts is understood as being an "expression of purpose" (Fisher, 1988, p. 3). This understanding embodies far more than just the physical tools or implements which are commonly accepted as being "technologies". As Fisher (p. 3) states, technology is:

> A quantitative expression of a particular perception of how to do something and of that something's environment. It is not, of course, restricted to the designer's expressions alone, those who interact with it also impress their own perceptions and purposes on it. Therefore a technology is more correctly a set of potentials for doing things.

Heidegger, in his analysis of the Greek term "techne", the root of our word technology", makes clear the connection between technology as is potential for "doing things" and the nature of this doing, as a way of revealing and structuring our understandings of life or being. Heidegger describes techne as poesies, a type of revealing the truth of things or bringing forth (creating) that craftsmen and poets engage in. For Heidegger humans can be involved in techne which lets beings be what they are, or they can be involved in techne which subjugates the essence of other beings (which he terms the Being of beings) to human purpose (commonly economic purpose). As a case in point Heidegger contrasts the technology implicit in a windmill with a coal-fired power plant.

> The windmill co-operates with the wind and hence, lets it remain what it is. To fire the generating plant, however, human beings must aggressively expose the energy contained in the coal, they must rearrange and store it for

> future use. (Zimmerman, 1983, pp. 108-109).

Authentic or true technology for Heidegger means allowing beings to manifest themselves as themselves, with as little interference and the most co-operation possible. True "technology" from this perspective would not be machines designed to dominate nature, but instead include all modes of knowing by which nature (creation) is revealed. Here machines and the arts may both be recognized by Heidegger as "techne". As Zimmerman suggests, from this perspective, for Heidegger technology will include the rituals, poetry and religions of a culture, as:

> . . . rituals, poetry, religion, are required to disclose most appropriately what beings are. (Zimmerman, 1983, p. 109)

Now, based on the understanding that our "reality" our knowing of the world, or "self understanding" of the world comes forth through socially constructed relationships, our technology as our "particular perception(s) of how to do something" and the "potentials for doing things" (Fisher, p. 3) will have arisen from within our social and cultural environmental experience. Hence, the "technology" which already surrounds us, and with which we may be so familiar as to be unaware of its particular presence, will be instrumental in shaping our perceptions of "how to do something". Our existing technology will direct, shape and limit the development of a set of potentials for doing things, including the revealing of the "Being of beings".

> There is a circularity here: the world determines what we can do and what we do determines our world. The creation of a new device or systematic domain (technology) can have far-reaching significance - it can create new ways of being that previously did not exist and a framework for actions that would not have previously made sense. (Windgrad and Flores, 1987, p. 177), (brackets are mine).

For this reason, I am concerned that the new technologies of electronic or computerized pianos, will be involved in changing our perceptions of reality and our understandings of the world. For if our thoughts (that are structured within social/cultural structures) generate our known reality, then in our thinking, we will focus our attention on particular aspects of our environment, depending on our concerns, interests or understandings of the moment and we will be blind to other aspects. Electronic instruments as a focus of our attention may be influential in reinforcing a "technologically Dominant" view of the world, where we become increasingly blind to the understanding of people as being an integrated part of the whole Creation.

As Heidegger states:

> The power concealed in modern technology determines the relationship of man to that which exists. It rules the whole earth. (Heidegger, 1966, p. 165).

Technology, the Piano, Electronic Keyboard and Synthesizer

I now offer a brief description of the technology involved in the piano, electronic-keyboard and synthesizer as a basis for comparing their potential to enhance our perception of the interconnectedness between people and creation (nature).

Firstly, however, a short note on the nature of "sound" is warranted as these instruments are all involved with the production of sound. For the purpose of this article, sound is understood as being "vibration in the air". At a superficial level, sound that we generally term music is differentiated from other kinds of sound by the regularity of these

vibrations in the air. Pitch is determined by the rapidity of the vibrations and the tonal quality of the sound, by the number and relative strengths of the subsidiary vibrations. The volume (softness/loudness) results from the amount of vibrational energy that has been applied.

In the piano, sound is produced through the player's fingers striking a key which causes a felt-covered hammer to strike the metal strings. The vibrations from these strings are then amplified through the soundboard. So there is a direct relationship between the player and the generation of sound. The sound heard from the piano comes directly from the instrument through the air, to our ears.

With electronic keyboards, the sound is also initiated by the player striking a key. However the volume and tone of the sound produced results from an electric current passing through a pre-amplifier with tone and volume control, an amplifier and transducer, and on to a loudspeaker or set of headphones.

A synthesizer is able to construct sounds according to the precise instructions of the operator. Precisely defined mathematical abstractions are used to analyze the wave pattern of sounds, enabling the tone quality of any sound to be given to any note, as determined by the operator. An assumption behind this process is that the true sound of whatever is being replicated will be captured by this scientific analysis. Sound is produced when the electric signal produced by an oscillator is fed into a loudspeaker. So a player keying in the code for a piano may believe that the true sound of the piano will be heard through the speakers.

The Role of the Piano and Recent Electronic Musical Innovations in Developing Ecological Consciousness

What follows are some of the reasons for my concern that electronic musical innovations will frustrate the development of a new ecological consciousness.

Electronic Instruments and Mechanised Nature

The use of these electronic instruments reinforces a mechanical concept of nature and people. For while the piano is also a complex technological artifact:

> There is a difference between a participating technology which lets the human meaning of a subject's act stand out and the automated technology which conceals it, creating the illusion of autonomous functioning. (Kohak, 1984, p. 25)

In playing the piano, whether it is the pianists' ability to provide the lightness of touch required for a Chopin waltz or bring a feeling of depth and strength to a Beethoven Sonata, the human meaning of her participation with this technology stands out.

In comparison, synthesizers and computerized music programs advocate their advantage as requiring less actual involvement by the player, with the technological hardware "magically" allowing the player to produce music s/he would otherwise be incapable of.

It is also significant that the technology that creates the piano is somewhat more obvious and accessible than that involved in these electronic instruments. With the piano we can remove the front boards and watch how it "works". I doubt however, that removal of the plastic cover of a synthesizer would offer such a clear picture. This "mystification" of the technology contributes to a more hierarchical rather than interactional view of life.

With electronic keyboards and synthesizers, the "machine" is capable of producing music that is difficult, or impossible for people to play (for example - difficult cross rhythms, or impossible to reach chords). Further consequences of such technological tyranny are that:

> [I]n the bewildering complexity of figuration, rhythm and metre are lost; the rapid succession of "difficult" intervals means that frequently pitch seems contingent. Yet - as in much of the music of Boulez - the conductor gives the "beat" with meticulous care, and the musicians generally play prescribed (notated) pitches. Thus rationality comes to seem irrational and, in a strict sense, incredible. This may be awe inspiring, but it is also mystification. (Ballantine, 1984, p. 95)

These effects have repercussions for how we perceive the world to be. Shepard in "Nature and Madness", also articulates this idea of "rationality" being seen to be "irrational" when people live in an entirely man-made artifactual world. These instruments contribute to such a turn-around in our concepts of rational/irrational through their, in a sense "superior" skills in certain aspects. These skills are in no way related to the organic or the physical skill of the person, thus the person/nature (Creation) relationship is further degraded.

Further, the "superior" abilities of these instruments reflects and substantiates our society's present concern with "perfection" as an object of itself, rather than a more experiential mode of being. As Kohak (1984) argues, each time we sacrifice the tangible goodness of self-labour for the perfection of such technological perfection we lose something of ourselves. The striving for perfection introduces a gap of alienation into our lives, reinforcing an "objective" ('us' versus 'the others') view of Creation.

Subjugated Authentic Musical Experience

These technologies involve the subjugation of a more authentic musical experience. I see these occurring primarily at *three* levels first. At the most fundamental physical level, inauthenticity of music making is thought to occur through the mode by which the instrument creates sound. As stated above, sound is basically vibration of the air. The music (sound) from electronic instruments reaches the listener through movement of air. which has not been directly instigated by the player. Rather "sound waves" (or air movements) are only caused when the "sound" (that is, the signals produced by the oscillator) is amplified (electronically) by the loudspeaker.

With these electronic instruments there is a change in the very nature of sound itself, through a process of sonic reductionism (Hopper, 1987). Sound no longer has its source in vibrating matter, but instead is generated in a world of circuitry which exists to create an electronic impression of a musical instrument.

The sounds are produced as discrete packages, in complete isolation from human players and their cultural reference point, musical instruments and the passionate articulate musical expression of skilled musicians.

The sound from a piano comes directly from the instrument, travelling through the air to our ears. With the piano, the pianist instigates the air movement through activating string vibrations, directly through his playing of the keys.

However, the sound produced by a synthesizer originates as a musical abstraction which is then translated into electronic impulses, travels through circuitry, pre-amplifiers, amplifiers and into loud speakers, where it is converted into the mechanical vibrations of the speaker membranes and thereby transmitted through the air to our ears. The sound we actually hear is not only reliant on mathematic abstractions of the tonal quality of the

original instrument, but on the level of accuracy by which the electronic equipment can unravel and re-present this "sound".

This concern with the authenticity of sound is commensurate with Heidegger's concern as stated above, to allow "the essence of beings" to be seen. Just as the windmill's working with the wind is contrasted with the more aggressive energy transformations involved in firing a generating plant, so the sound production of a piano may be compared to that of electronic musical instruments.

The *second* level of concern over inauthenticity, is that with electronic keyboards and synthesizers, there is a removal of direct control of the person playing the instrument. With both these types of instruments volume (or dynamic level) is adjusted by means of pedals, knobs or slides, rather than by the more direct body, hand and finger control required when playing a piano. The direct "finger touch" control involved in playing the piano allows the transfer or felt emotion through the person, directly to the way in which the sound is shaped. The limits of the piano in this regard are recognized here in comparison to the direct control implicit in use of the human voice.

The problem is amplified (excuse the pun!) by the technological complexity of synthesizers. It is interesting to note that the world's best selling synthesizer, the Yamaha DX-7, is virtually impossible for users to program. Users have to use special plug-in cards which give them access to hundreds of factory produced sounds (Pree, 1988, p. 84).

The manufacturers and promoters of this machine are able to control or direct in some measure (discounting the ingenuity of the user) the propensity for the music making of this instrument, and thus a more hierarchical way of life is again engendered.

A synthesizer in producing a "piano" sound is still not a piano. It only appears to be like a piano in the type of sound it produces.

The piano has had a long history in Western society. From the days of clavichords, virginals and spinets, to Cristofori's early pianos, the development of the grand, baby-grand and upright pianos has occurred interactively with the normative cultural expressions of the time. Our pictures of the history of the piano subtley inform our relationship with the instrument today. The history of the piano, its perceived place in our world, our social interactions involving it, all contribute to our understanding of this phenomenon called "piano".

Currently in our Western society, there is appreciation of naturalness, of our artifacts having obvious links to the "natural" environment. Pianos in being traditionally manufactured, and in being produced from timber as a "natural" organic material satisfy this interest, and through their perceived links to nature, foster some awareness of there being a "natural" or "not man-made" world of which we are a part.

Electronic instruments in appearance generally highlight their generation as sophisticated "man-made" pieces of technology, reinforcing the notion that people may indeed "master" or dominate creation/nature. This problem is exacerbated when the electronic instrument is used for replication. A synthesizer when used to replicate a piano is involved in reinforcing the notion that our "models" of creation/nature or reality, may indeed be swapped for the reality itself.

The third level of concern with the authenticity of musical experience is related to this idea of replication. Often when an electronic instrument is designed and used to replicate a musical instrument, the extent to which people are deceived into thinking they are listening to the "real thing" is the criteria by which the instrument and its use are judged to be successful. However, when we consider the effect of deception in our relationships

with other people, we recognize that such deception causes feelings of uncertainty and mistrust, usually resulting in some estrangement to our relationship. Our relationship becomes objectified and commoditized; rather than feeling "at one" with the other person, we feel mistrust and need to stand back and test for authenticity in our relationship.

If reality and meaning are constructed socially, within particular cultures and environments, our sense of "self" is reliant on how we perceive life to be, through these processes. Involvement in a world in which things "pretend" to be other things, will seriously affect our sense of "self".`

I suggest then, that the piano has more potential for authentic, direct, personal musical expression than electronic keyboard instruments. This is not, however, to fail to recognize that the human voice is an even more authentic means of expression.

In Conclusion

In comparing the piano with these new musical innovations I have not sought to thoroughly discredit them, but rather to draw attention to the values and world-views inherent in these technologies. I have sought to discuss our participation with electronic musical technologies in the light of recognizing true "techne" as a "letting things be", a revealing of nature. This understanding is both an ancient idea and a completely new possibility in the context of our modern technologically oriented world. Musicians then, in Heidegger's sense of "techne", are inherently technologists, participating in revealing and bringing forth our world. And, as Ludwig von Bertalanfly has said, artists and intellectuals or musicians, as in this context, are:

> The hidden marionette players of history - those who create world views, values, problems and solutions; in short, that symbolic backdrop against which every scene of the great drama of history is enacted. (Evernden, 1985, p. 50)

My perspective in writing this article is to recognize that the music of a culture reflects the world view of the culture. It both reflects understandings of the relationship between people and their environment and also acts as a vehicle which extends perception. As such, my concern is to raise awareness of the potentialities of electronic musical innovations to enhance or detract from an ecologically harmonious sense of self and the environment.

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