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Music Notation and the Search for Extra-Terrestrial Intelligence

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Music notation may be considered a medium of contact between composer/musical idea and performer/perceiver/recipient. It is of paramount importance that it remains alive. By definition, this implies a state of continuous evolution and redefinition. As such, it must resist the logical fallacies exhibited by vain attempts to create standardization in the face of manufactured crises, misunderstood notions of interpretation or composer's intent, historical reconstruction, and musicological fixing for all time.

I am attracted to a view of composer-performer relationships, which, in many respects, is analogous to the position of the observational astronomer involved in searching for extra-terrestrial intelligence, (SETI). The SETI astronomer looks for a message without any knowledge of what the sender's conception of a message may be. This seems an ideal state of mind for the creative performer to be in. It provides composers with the opportunity to create notation objects, anticipating the dynamics of discovery for the musician. It reminds the performer to continuously ask such questions as: "What is musical intelligence?" "How can it be discovered inside a work?" "How is its order deciphered?" "How does its existence drive the ontological evolution of the work?"

Message senders and receivers may interact by means of expanding fields of influence. (My recent work, *Zones of Influence* (1983-5), for percussion and computer-aided electronics, addresses this.) In the case of the astronomer, the observer's field expands, as does that of a star or other celestial object at the speed of light. The two fields overlap and interact within the dimensionality of space-time. Composers' and performers' fields expand and interact with a great variety of speeds and within a great variety of concept spaces. In both cases, dynamic interactivity must be assumed.

For purposes of discussion and hypothesis formation I will refer to three aspects or three types of music notation. In each case we assume the composer may be involved in creating a uniquely ordered musical reality. Then we consider notation as communication, as documentation, and as artifact.

Communication

Here the word communication is used in its mathematical sense. Something is encoded. Somehow it is transmitted. Something is received. Something is decoded. The search for a message involves pattern recognition, the immensely complex study of relationships between order and randomness. Inevitably, a message hypothesis leads to extraction of assumed intent from the discovered order. This involves psychology and cognitive modeling. A message may be imbedded inside a structure. Its discovery may be part of intended conditioning for performers. Does notation require social agreement? "No", says the SETI astronomer. Intelligence can be detected in the absence of prior arrangement of message conventions. Of course, there are advantages and trade-offs to having a set of available assumptions. Conventions facilitate communication efficiency. Communication efficiency may be defined as quantity of information received divided by the effort required to extract the message. Communication theory tells us that, theoretically at least, a message can be detected in the presence of any amount of noise given enough time to analyze what is received. A unique musical intelligence may require a large amount of time to detect and comprehend. It may be worth the effort.

Interpretation requires understanding the concept of symbol as representation of idea. A musical sign becomes a *significant* through the mediation of experience, which implies evolving musical cognition. A danger is imbedded in the question: "Does cognition drive the structure of language or, at a certain point at least, does language direct possible cognitive formulations?" Poetry may be more free than prose since normally the latter must acquiesce to linguistic and syntactic correctness. Each musical work can involve the birth and evolution of an entirely unique musical syntax. The feeling of being awestruck by conceptual breakthroughs often results when fundamental changes in base realities are imbedded inside linguistic structure. This may amount to the communication of entire cognitive constructs. How does one communicate such a major restructuring of pointers in a relationship matrix most efficiently? . . . an interesting question for a composer to ponder.

The creative performer or perceiver can learn from enlightened anthropology. If we can resist the temptation to dominate them first, we can learn to communicate *with* cultures whose language and cognitive styles may be radically

different from our own. Performers and innovative composers may be in an analogous relationship today. The insightful message recipient will not react to a work with mechanistic, stimulus-response programs. Rather, informed and rich interpretation will result from assumptions accompanying a more interactive process, in which transmitter and receiver, sign and significant, stimulus and response exchange roles rapidly and often.

Documentation

Notation intended as documentation becomes a remnant of a musical reality. It may represent the fixing of a cognitive construct. It may be intended for reconstruction or not. It may contain a necessary guide to understanding the communication aspects of a work. It may provide auxiliary information to the experience of perceiving a work created without notation, (i.e. as with many electro-acoustic works). It may chronicle the evolution of a composer's language and style.

Artifact

Notation as artifact may imply that it is the art object, complete in and of itself. Within the artifact we may search for musical intelligence. In the script of my work for orchestra, film, and synthetic speech, *In The Beginning V (The Story)* (1980), a possible definition of intelligence is offered. "An entity exhibits intelligence if it is engaged in increasing comprehension of the process of its own evolution and that of the supra- and infra-organisms in relation to itself and if it demonstrates a facility to operate in contrapuntal symbiosis with and is engaged in synergetic facilitation of this process, as an integral part of it, with a degree of self-originated and willful motivation. This is by inalienable and universally evident design a necessarily self-referential definition."

In my musical works I have explored notation with respect to the above concerns. Many works use more or less *standard* music notation because it is efficient and sufficient for a large universe of ideas. Many works use no notation beyond the composer's notes, particularly the electro-acoustic ones, though the processes of composing and realizing them may be documented later. Some highlights follow.

In *A Precipice In Time* (1966), for percussion and other instruments, graphically notated musical gestures are hung on a highly calculated structural scaffolding. A scale of degrees of freedom in the gesture notations is arranged so that intervals on it may be used in the compositional schema. In *To That Predestined Dancing Place* (1967), percussion quartet, and *Then We Wound Through An Aura Of Golden Yellow Gauze* (1967), actresses and instruments, the notation serves to provide navigation charts through a diagrammatic universe of abstract relationships involving opposites and paths through which one musical entity is transformed into its parametric opposite, (i.e. black into white, dense into sparse, ringing timbres into muffled timbres, etc.). *On Being Invisible* (1976-7), for neurological signal analysis and sound synthesis, involves documenting a process of discovering musical order in the information processing patterns of a performer's brain, resulting in an attention-dependent sonic environment. Other works, such as *And Come Up Dripping* (1968), for oboe and analog computer, "*mississippippissississim*" (1968), for speaking voices, clavés, and tape, *She Loves Me, She Loves Me Not, . . .* (1968), for percussion, tape, mimes, electronics and multi-media, and some aspects of the *In The Beginning* (1978-81) series of works, involve notating gestures, controlling interactive processes, ritual games, psychological and social relationships among performers, improvisation, and sonic textures made up of large numbers of parts. More recently, *Zones Of Influence* (1983-5), addresses questions of how notation relates to using real-time algorithmic processes in an interactive computer/instrument situation, describing improvisational spaces, and showing event probabilities. A technique of time notation establishes "likelihood-of-occurrence rhythms" in one movement while others use a great deal of traditional notation for fixed parts along with the algorithmic schemes.

Here is a prescription for keeping the idea of notation alive. Continue to search for musical intelligence, structure, negative entropy, pattern, evolution, order, stochastic maxima, or whatever description of possible intention is expedient for the mental technology of the time. Strive to always be in the condition of searching, like the SETI astronomer. Let the idea of discovery be nothing more than fuel for continuing a journey in the craft of exploration. Take no solace or security in the notion of finding, no matter how magnificent are the answers a particular insight may provide. Know that this is the life force of creativity, the endless evolution of which is the most exciting discovery of all.