Resonant Complexity

BY BRIAN ENO

Stewart scrawled "publishable as essay" across the top of this. It's Brian Eno's response to a proposal; a rough sketch of a new theory of music. It was addressed to Eric Iverson and Mark Davis at the Computing Research Lab in New Mexico. —JS

Your proposal appears to suggest that it ought to be possible to create a way of measuring or assessing musical compositions in terms of their complexity, and that you expect this internal complexity to be related, in some way or another, to the compositions' "musicalness" — the degree to which we think it's good or interesting music.

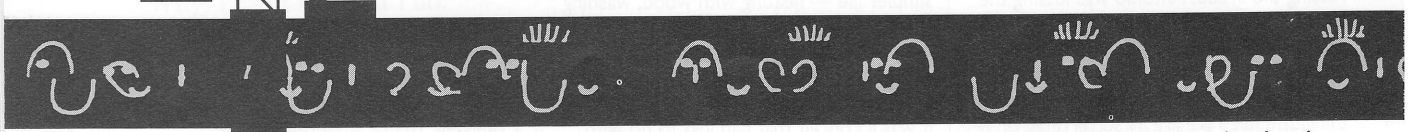
This seems like a project that might not succeed in quite the terms you're suggesting, because the interesting complexity is not so much in the music as in the listener. By that I mean that music is actually a contingent combination of sounds whose emotional resonances are entirely dependent on the audience's personal and shared histories as listeners. By "contingent" I mean that it could have been otherwise. Music didn't have to consist of the elements and structures that it happens to consist of — and indeed it consists of quite other ones in other cultures, as anyone attending a concert of classical Thai music will soon realize. (I once attended such a concert in Bangkok that was totally mystifying. I could see that the audience was utterly enraptured, swooning at moments of apparently overwhelming emotional beauty that made no impression on me whatsoever; not only that, I couldn't distinguish them from any other moments in the piece. You might say that there was too much complexity in the music for me to be able to deal with it, but I'd rather say that there was not enough relevant complexity in my mind to experience it. I had no cultural background against which to set this particular adventure.)

So complexity, I'm saying, has to be present, but present in the whole system — music and listener — as a system. If it's just in the music (whatever complexity would mean in a purely objective sense like that) it makes no difference to anyone. The reason we can be moved by a single voice singing a simple song is clearly not because it has internal complexity, but because we do: we don't just hear sounds, but hosts of associations and historical, social and cultural undertones. A single voice is powerful to us because it is different in particular ways from most of our other musical experiences, and because this particular voice is different in particular ways from other voices we've heard. Aesthetically, what we respond to are differences, not "absolutes." That is why it is possible for a group of Lebanese to become ecstatic about the way Fairuz turns a phrase, while a non-afficionado of Arabic music will fail to get the point at all. What those Arab listeners are responding to is how she does it differently. So when they hear it, they hear it against an enormous repertoire of other possible ways of doing it, of other possible emotional resonances and associations.

This is a very important cultural issue, since it sets up a major division between two different ways of looking at cultural objects. In the traditional classical view, art-objects are containers of some kind of aesthetic value. In this view, the value was put into them by the artist (who got it from God) and it now radiates back out to those who behold it. It was thus that missionaries played gramophone records of Bach to Africans with the expectation that it would civilize them; they would somehow be enriched by the flood of goodness washing over them. We now see the arrogance of this assumption, but I think few people understand what is really wrong-headed about it aside from its political incorrectness: culture objects have no notable identity outside of that which we confer upon them. Their "value" is entirely a product of the interaction that we have with them. Duchamp's urinal was proof of this. Things become artworks not because they "contain" value, but because we are prepared to see them as artworks, to allow ourselves to have art-experiences before them, to frame them in contexts that confer value on them.

If I believe this, why, you might wonder, am I interested in A-Life based composition systems? Well, I think the idea is still full of possibilities, but only if we start out the right way and without misleading assumptions.

My background as a musician/composer comes equally from avant-garde systems music and popular music, and I've spent a lot of time inventing "machines" for making music.



In this diagram, several graphic elements are allowed to cycle freely. Imagine that these represent musical events — single notes, chords, sounds. Each has its own independent cycle length, so new configurations of sonic elements are continually being formed. The more complex the numerical relationships between different cycles, the longer it will take for particular configurations to repeat.

I made a series of records that had an unusual organizing principle: *Discreet Music* (1975), *Music for Airports* (1978), some of *On Land* (1981), *Thursday Afternoon* (1984), *Neroli* (1993). In these works I assembled a group of musical elements — these could be single notes or atmospheric sheets of sound or short phrases — and then set in motion a process whereby each element recurred in its own regular cycle. The important thing was that all the cycles were of complexly different lengths: they were not locked to each other. The result of this was a continuous permutation of the various elements as they fell together in different clusters. I find this absolutely delightful and sit back grinning like a Cheshire cat as I listen to it unfold.

I occasionally set up live versions of these systems, using four or five tape players that each carried long loops of sound material and which are then allowed to run out of sync. These loops are typically between fifteen and forty minutes in length. In this way it is possible to say that some of the pieces of music I make have a theoretical duration of several years (the length of time it would take before all the players were back in sync with each other). This is appealing: I like the idea of a piece of music that continues making itself whether I am there or not, and which has a life cycle that no one listener could ever fully experience.

Of course, the most important organizing principle in such works is not the machinery that I set up, but my brain (as the specifier of the original elements) and the brain of the listener. The listener's brain is what makes this experience into music. The pieces rely a great deal on the observable fact that a listener, faced with a series of juxtaposed events and being led to believe that they are music, will tend to hear them as such. Brains hear patterns and connections, or certainly seem to try their hardest to. In a sense the function of "composer" then becomes shared between me (who set the thing in motion) and the listener (who connects it together mentally). I still think it's a breakthrough to say, after five hundred years of people creating works of art that relied on synchronized behavior: let it run free — it will appear connected . . .

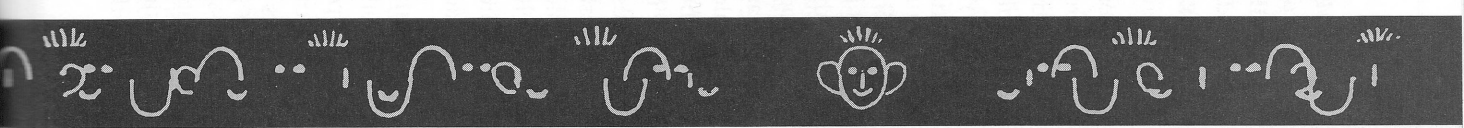
These pieces were a success in that they generated types of music that one wouldn't have arrived at by other compositional techniques. There is something distinctive about these works. I have always, though, thought that they were just the beginning of something more interesting, of pieces of music that could not only create themselves, but do it in some kind of adaptive, evolving manner.

This next step is what has eluded me. Listening to my pieces, I used to hear particular sequences and clusters that seemed to want to stand alone as little musical organisms within the whole piece. I wanted to somehow isolate and "promote" these; in fact, I was after a way in which the random patternings generated by the original process could evolve into more complex "clumps" that then themselves recurred. I was very conscious of the evolutionary parallel here, and I liked it, but I never really solved the selection problem. Ultimately I just chose bits I liked, but I was unhappy that the criterion of selection — the decision about which clumps survived and multiplied — was only my taste. That seemed a bit of a cop-out to me, since much of what I liked philosophically about the works was that I suspended judgment and let them make themselves. I felt that letting my taste be the deciding factor at this point was somewhat backward looking, a return to the mindframe of traditional composition. Nonetheless, I tried it in a few pieces. On "1/2" (*Music for Airports*), for example, I put material through the permutation process and then edited it in such a way that certain favored sections recurred. Musically I felt this was very beautiful. Philosophically I was uneasy with it.

What I want is to imagine the music as the working out of an internal evolutionary process. What would that mean? It would mean putting together a set of conditions in which the music is able to form itself into "significant clumps," and then creating a way of making those clumps persist and multiply (in music, repetition is a form of structure). This means inventing criteria of selection (by which it is decided that some clumps survive and others don't) that are internal to the work. I don't want to have a God in this universe: I don't want to be the selector. I want the piece itself to create its own structures internally, and to somehow recognize and favor some of them over others. My other works described above do, of course, create their own structures. The problem is that there is no feedback within the pieces, no way whereby the present condition of the piece can affect its future condition. Things happen, then other things happen: the music doesn't change in relation to its own history but simply carries on permutating, throwing up new patterns. Another way of saying this is that the level of complexity doesn't change over time. In terms of evolution, the pieces are static. It's like the primordial soup continually throwing up new molecules and amino acids which then never combine into larger units. I am making soup — provocative and sometimes very tasty soup — but still soup. I want to try making organisms.

Lately I have become more and more convinced that the clue to making pieces of music that work (because I'm a record maker, that means pieces of music you like listening to as well as find intellectually interesting) is to choose a "rich substrate of combinatoric primitives" as you put it — what I call the basic elements. My own experience is that, if you work with a set of elements that are all compatible in any combinations, then you only have to invent interesting ways of making the combinations happen. I've found that good work can be achieved with very small groups of elements; the substrate does not have to be "rich" in numerical terms, but it must be "richly connectable." And being "richly connectable" means not only that the elements can all fit together, but also that when they do we are able to perceive and care about the difference between various combinations and sequences of them. That means that we have to elicit a sensual involvement with the materials of the piece — which is to say that we have to be richly connected with them.

I've rambled on a bit here, sorry. What I am trying to do is to float a theory of music, I don't know if it's "right" or not, but I'd like to hear how it sits with you, if it seems to make any sense. You'll notice some inconsistencies in what I've said. I'm still busy figuring all this out myself . . .



Occasionally configurations occur which seem quite unlike any of the others, striking us as deliberate and planned and carefully synchronized. I recall at one of my installations hearing the four unsynchronized audio tapes suddenly assemble themselves into the first bars of a Tammy Wynette song. It was just another configuration, as uncontrived as any of the others.