

# Braxton's System: An Artificer's Intelligence

by Mike Heffley © 2000

## *Introduction*

- *artificer* 1. a person who is skillful or clever in devising ways of making things; inventor. 2. a skillful or artistic worker; craftsman. [1350-1400] . . .
- *artificial* 1. made by human skill; produced by humans; not natural. 2. imitation; simulated; sham . . . 3. lacking naturalness or spontaneity; forced . . . 4. full of affectation; stilted. 5. pertaining to a taxonomic classification that groups together unrelated organisms. [1350-1400] . . .
- *artifice* 1. a clever trick or stratagem. 2. trickery; guile; craftiness. 3. cleverness; ingenuity. 4. a skillful or artful contrivance or expedient. [1525-35 . . . artificium craftsmanship, art, craftiness = arti-, comb. form of ars ART + -fic-, comb. form of facere to DO, make . . . ]--Syn. See TRICK...
- *artificial intelligence* 1. the collective attributes of a computer, robot, or other mechanical device programmed to perform functions analogous to learning and decision making. 2. the field of study involved with the design of such programs and devices [1965-70] . . . [1](#)

The nuance developed through the above chronology of definitions resonates nicely with the persona and reception of composer/saxophonist Anthony Braxton throughout his thirty years in the public arena. From the beginning, he has been hailed as a skilled musical innovator, both as composer and improviser; for as long, he has also been criticized, even dismissed, as stilted, affected, one whose potential has been wasted in ill-conceived attempts to raise healthy musical offspring from a forced marriage of the cutting edges of jazz and Western art music traditions. [2](#)

Braxton emerged in the late 1960s as one of the important voices in a jazz discourse that featured then-recent and controversial innovations from figures such as Ornette Coleman, Albert Ayler, John Coltrane, and Pharoah Sanders. These and other artists were opening up the field of improvisatory expression from song and blues forms to unprescribed spontaneity, to prescribed experiments, and to the systems and forms of both Western and non-Western music outside of jazz conventions.

Braxton gravitated toward twentieth-century American and German composers--Ives through Partch through Cage, and Schönberg through Stockhausen--for his inspiration, expanding his ground in this newly-broadened jazz-improvisational field to their direction. The result has been a body of work designed both in the European classical tradition--scores to be conducted and

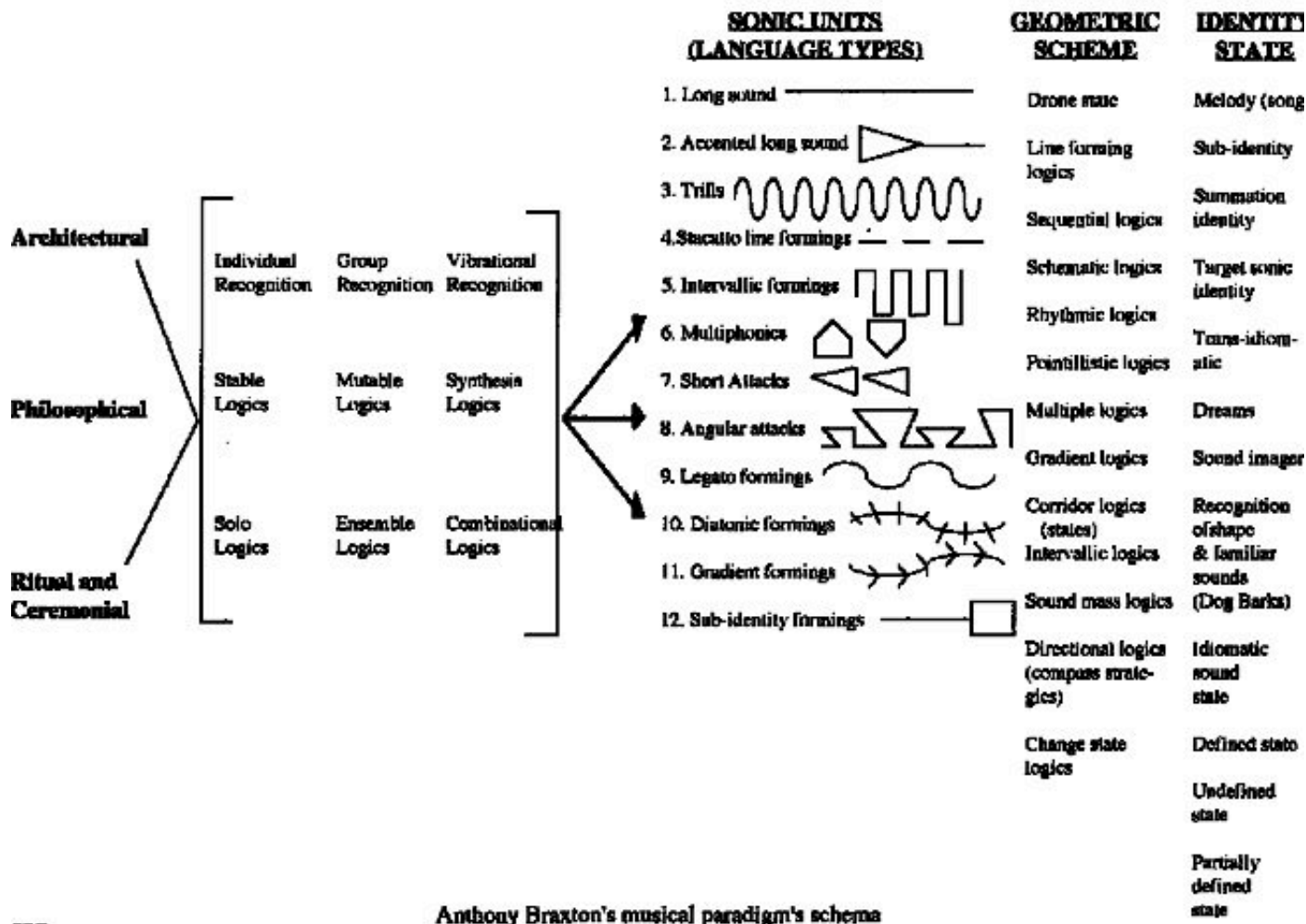
interpreted and performed in concert--that also features improvisatory (personally expressive) and musically experimental (chance, sound sculptural) aspects.

Since Radano (see last note) noted the mixed American reception of Braxton's music, Braxton's media image has ripened somewhat into that of a respected elder statesman of the "new and improvised music" scene. He is, to date, one of the most written-about living artists under that rubric, with four recent books (Lock 1988, Wilson 1993, Radano 1993, and Heffley 1996) in two different languages from three different countries in the last nine years, and a steady stream of journalistic and scholarly articles.

Nevertheless, in Europe his image problem has been the same as in America--although, along with Braxton's own concert and recording opportunities, both (earlier) "free jazz" and (more recent) "new and improvised music" has flourished more there and in Canada than in the U.S. People have usually either loved or hated his approach, because of their own investments in (1) the Western compositional tradition and its assumptions, or in jazz's improvisational traditions and processes, each as something more--or at least differently--evolved than the other; and (2) high/low cultural distinctions (again, with a bias for either side).<sup>3</sup>

Braxton's idiosyncratic approach is, in itself, no longer his most radical gesture, in postmodernity's bloom-of-a-thousand flowers;<sup>4</sup> however, the *details* of his particular vision--a synthesis of the "free improviser" and the "composer," of the classicist and experimentalist, the "low" and "high" in culture--remain, in his personal voice's terms, as difficult for many to grasp, much less embrace, as it has proven difficult to actually change cultural problems of class and racial inequities even after they come to the light of public discourse.

For a little longer than Europeans have been in the Americas, then, the English language might have named Braxton an artificial artificer in the fullness of both positive and negative meanings above. Over the course of his work, an *artifact* has emerged that our language, since its spread to America, might label an *artifice*--suspiciously, admiringly, or both--per above definition.



Anthony Braxton's musical paradigm's schema

In my book on Braxton I presented this artifact (233) as a chart of his musical paradigm (Fig. 1 here). He calls it his "Tri-Metric" system, and its structure is indeed much like a piece of music in 3/4 time (or, more precisely, 6/, 9/, or 12/8, since each of the three primary aspects on the left of the chart splay off into nine possible manifestations, then develop three more sets of twelve possible directions). It is the pool of potentials from which he makes his musical events, both improvised and composed; it accounts for both the extramusical contexts (as, for example, both the Lutheran mythos and liturgy accounted for Bach's masses) and the strictly musical aspects (as did, with Bach, the diatonic system and Baroque forms) of his work.

It is artifact simply because it is a product; it is artifice because it is a product intended both to represent and to generate a process. In this duality lies its trickiness: see it only as a stable representation and you may be unsettled by the instability of its generativity; see it only as a formula for musical creativity and you resent the stability of its fixed terms as something arbitrary and subjective asserting itself as objective and universal. To those who respect and nourish themselves on what it generates and reflects, it is a formula for good music magic; to those who find its issues meaningless or even toxic, it is a trick of smoke and mirrors.<sup>5</sup>

This description, of course, might work equally well as a critique of the whole Western enterprise of musical literacy, of scores that fix and reify the fluid. It thus brings up questions about the nature of musical notation; it begs comparisons here between such notation and computer programming, and questions about how interpretive/improvisatory inspiration can result from human engagement with musical notation, and similarly how or even whether such a thing as "artificial intelligence" can truly result from the machine's byte-crunchings. We will return to these questions.

My book's treatment of Braxton's chart--as those of Lock (1988: 28) and Wilson (1993: 99) of its earlier versions (when it consisted mostly of the "Sonic Units" column, with separate explanatory outlines)--served well enough the reader's curiosity about the rationales and intents behind the music's sound. I further explored the chart for its potential as an analytic tool. In all, my explication there sufficed as one person's attempt to penetrate a public person's private universe in the public arena.

After that writing, as his graduate teaching assistant at Wesleyan University from 1993-96, I was much more privy to the work of this composer on its daily basis, including his uses and developments of his system and its schematic. From writing like an historian about Bach's craft and expressions of Christian devotion, I helped the composer at that craft and joined him "in his prayers," as it were. Over those years of musical collaborations, research, and conversations with Braxton about his work, I developed a different feeling for this Tri-Metric system.

In short, what I once did experience as a *system* by which I could rationalize and explain Braxton's work, which I could even try out for my own work (as a student might write Bach chorales), I now experience more as if it were a *sentient being*--like (allow me) the Star Trek gang experiences their friend and colleague, the irresistibly "human" android called Data. (This, of course, brings us through the image of "artificer" as a skilled human, through "artificial" as lacking grace more than showing skill, through "artifice" as evincing skill but also deceptive intent . . . to "artificial intelligence," a concept born in our language right around the time Braxton's career began, and born largely free of the earlier negative associations to a field of definition still open (except, of course, in the plethora of science fiction scenarios variously cast as utopic or dystopic).

More: the experience of coming to that point--of knowing this "Data" as a human artifact but also as a sentient being in its own right--has translated to my relationship as a musician with other "systems"<sup>6</sup> I have studied and worked in the course of my education: Medieval modalism, Renaissance part play, Baroque counterpoint, American shape note, the blues, Romantic chromaticism, serial chromaticism, and bebop chromaticism have become a congress of beings conversing in my mind and the world, with whom I can engage as the system(s) I myself comprise in my organic whole--as idiosyncratic, as much a mix of autonomy and

interdependence, and as charged with the associations of my times and places as (!) they.<sup>7</sup>

This paper, then, deconstructs the chart to emphasize the component and composite human experiences it (the chart) describes, embodies, and evokes. I consider here Braxton's recent interest in Artificial Intelligence and his attempts to apply that field's issues and technologies to the musical system he had been developing since his beginnings. I conclude by considering distinctions between generative system/style and generated statement, musical notation and the dictation that is algorithmic programming, artifice and intelligence, human and homunculus, art and trick, and trick and trickster.

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For the biographical details that most richly background and contextualize this chart--Braxton's personal needs, gifts, and agendas for music--see Radano (1985, 1993) and Heffley (1996).<sup>8</sup> In the two pages of my book's text devoted to the chart, I demurred at going beyond a cursory and general explanation; in a lecture on it some four years later (see last footnote) I did tackle the chart's terms, in a personal and exhortatory voice I hoped would both clarify Braxton's meanings and stimulate my audience's own latent links with and spins on them. I constructed and led my audience through a visualization, a vicarious walk in the shoes of the artist through his process, since it had become a walk I myself had taken with him many times by then.

The following is an approximation of the explication I gave of the chart in my lecture, the one part I presented without the aid of notes or script. The informal and second-personal voice is chosen here for the same reason as there: to convey an insider's informed insights and viewpoints, and to demystify and humanize, to warm and personalize something that has put off many as forbiddingly esoteric, abstract, subjective, and cold.

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You are an alto saxophonist who has been well schooled in both European classical theory and practice (through private lessons and public schooling throughout childhood and adolescence) and jazz (through the recordings, books, and live performances and personal contacts of your most immediate cultural time and place, including your own novitiate professional experiences therein). You are about to pick up your horn and practice, as you have for some ten or twelve years, since first touching it in childhood.

Now, however, for the first time, your consciousness is split; not only do you want to warm up, have fun, get engaged and interested, walk away satisfied, as always--you also want to observe and reflect on every moment of that process and experience as it unfolds. You want to leave behind the rules and conventions and models you took in as a means to learn your instrument

and craft; you feel it is time to explore your own potential as a shaper rather than a mere interpreter of such things. More: you want to chronicle and chart it in such a way that you can convey it both to your own future self, to stay mindful of it and to develop it further, and to other interested parties (students, fellow musicians, scholars).

Before you make a sound, the process has begun. In your mind you notice it, a preparation for that first sound. What will its "architecture" be? a single-tone drone? a furiously fast, rhythmically complex line? one following the other? both juxtaposed together (imagine other players there with you, at your command)?

"Philosophically," what is its nature? Is it coming from a spirit of peace? of rage? of oneness, or multiplicity? harmonious or contentious? what is the worldview, the psychology, the intent behind it, in you and in the world with which you associate it (in others anywhere and anywhen from whom you might feel it projecting to you)?

"Ritually and ceremonially," where and how do you imagine its function in spacetime? on a stage in a concert hall? on a recording? on the street? alone in the woods somewhere, or in your room alone? for the masses, for posterity, for your lover's birthday, for your child's graduation ceremony or football game? Is it something you want to be fixed into notation exactly as it is played, to be played again exactly so? or to work as a suggestive generator of other sonic events? or simply to skip like a stone over the riverwater of time and forget? Is it something you experience as private as your own unutterable dreams and thoughts, or do you feel it somehow entrusted to you to share as widely as possible? How does the exact same music become different solely through contextual changes of time and place?

Having fixed these questions in your mind for reflection, you make your first sound. You did not consciously, rationally determine and then will it so much as simply make what you felt like making without thinking about it. It is a long sound; it serves your physical-mental state to repeat it, to work it, warming up your horn, attuning your organism to the feel of it, savoring and enjoying it. It takes on a little throb, a pulse, shaped by your breath; you oscillate between control and surrender, inhale and exhale. After a few moments it seems to have a life of its own which you are feeding, tending, observing, much more than willing or generating. Gradually you lose yourself in its flow, lose consciousness of what you are doing to generate it.

Suddenly this flow of sound in time is interrupted by a vivid memory of the dream you had last night, or perhaps ten years ago, or in your early childhood, a memory you had forgotten you had. Or, perhaps, a visualization of the sheerly sonic drone pops before your mind's eye-- perhaps an ideal geometric line, perhaps an ocean, or a sky, or outer space. Or maybe you simply feel like you have had enough of it, or you experience it as a prelude to the next thing you are about to do, you know not what.

One possible trajectory, then, is this:

\_\_\_\_\_ = long sound --> drone state --> dream

After you write it down you continue to explore your horn, your physical-mental experiences through your practice sessions. Eventually you come up with eleven more "sonic units" to which you are drawn, each capable of being developed through any one or more of thirteen distinct "geometric schemes" into any one or more of twelve distinct "identity states," all originating out of the three different aspects (you call them "architectural," "philosophical," "ritual and ceremonial") of potential. Each of these you experience and generate as personal truth ("individual recognition"), collective truth ("group recognition"), and/or cosmic, or physical truth ("vibrational recognition"); you do so by means of composition ("stable logic"), improvisation ("mutable logic"), and/or a synthesis of the two ("synthesis logic"); and you do so as a solo artist (music as individual expression/tool), in ensembles (music as social event), or in a mix of the two ("combination logic," reflecting the relationship between the individual and the collective).

(The symmetry of the number of elements--three sets of twelve<sup>9</sup> musical aspects generated by a twelve-pected set of potentialities pleases you too, because you did not seek or will it, you simply stopped your lists when you felt they were sufficient to your needs and possibilities. You half note, half marvel at their symmetry's synchronicity with other musical and mythical elements that have fascinated you throughout your life--the mystical expressions of Unity, Duality, Trinity and Quaternity in philosophy and theology, mythology and folklore, and their prevalence too in nature. You think similarly of patterns of twelve: the houses of the Zodiac, the hours of the day, the months of the year, the notes of the chromatic scale, the Christian Apostles. Your chart points out to you some deep resonance in your own biological clock and psychic imagination with these numbers and their recurrences in such things, and you begin to understand them all much more personally, and yourself more transpersonally.

Most of the "sonic units" to which your relationship with your horn draws you are common, simple and conventional and can be described with such terms; a couple you describe with your own graphics and words: "gradient formings," those in which one or more musical elements--volume, tempo, pitch, timbre--gradually changes; and "sub-identity formings," in which something begins as a part of something else, then digresses into an independent identity--for example, a snatch of some familiar tune that develops as a submotif out of your "diatonic formings," ends and then yields to the latter; or a section of trills set within a piece primarily comprising long tones.

Your "geometric schemes"--the kinds of patterning that develop as you play and work with

these sonic units, following your intuition of their innate tendencies and potentials, the directions they suggest to you, the flows in which they comprise the moments of the "sonic units"--prove more idiosyncratic and peculiar to you than do the sonic units. "Drone state" and "line formings" (such as Indian *vina* and *sitar* players, respectively, or bop bassists and horn players make), "rhythmic logics" (such as you associate with pan-African drumming, including jazz), "multiple logics" (such as you enjoy in the different juxtapositions of rhythmic patterns and melodies, tempos and meters you hear in parades, or, again, West African drumming, or early Western polyphony, or recent composers such as Stravinsky or Ives), and "intervallic logics" (as crafted by the choices of composers or improvisers eschewing the tonal system, such as Webern, or Cecil Taylor) are all fairly obvious strategies, and come with little forcing. Others as obviously yield results more unique to your own mind: "sequential logics," the ways you choose to, or unconsciously, repeat pitches, phrases, forms spread over time; "schematic logics," stabilizations of musical flows into scores, written or internalized mentally; "pointillistic logics," events you construct by dotting time and silence with sounds you experience as random, unrelated; "gradient logics," an extension of gradient formings from fleeting gesture to fullblown event; "corridor logics," something devised specifically to link two "identity states;" "sound mass logics," your versions of aesthetics explored by composers or improvisers such as Stockhausen, Coltrane, Ligeti, and Penderecki; "directional logics," ways of moving a piece in a certain direction (high to low, loud to soft, etc.); and "change state logics," something quicker and more developmental than corridor logics, and trickier, craftier (like a modulation) than directional logics.

All of these strategies are processes that produce "identity states." Some, again, are conventional, however peculiar in substance (sonic units) and form (geometrical schemes) to you: melodies, idiomatic (blues, bebop, a serial piece), "target sonic" (the big band sound, the string quartet sound), "trans-idiomatic" (a synthesis of cool jazz and chant, Ragtime and North Indian music, in your voice), "iconic sounds" (dog barks), "sound imagery" (simulation of a rainforest, an ocean beach, or outer space), dreams (your own inner visualizations, those you postulate in your listeners). "Sub-identity" is the end result of sub-identity formings, "summation identity" the conclusive emergence of actualizations of tendencies experienced as potential evoked by the sonic units and geometrical schemes; "defined," "undefined," and "partially defined" states describe your own intuitive feeling about a musical event as you conclude it.

(You note with interest the progression from top to bottom of your three "sounding" columns as one from simple to complex elements and concepts.)

So: these are your subjective principles, fished out from deep inside yourself as well as from the world, named with your names and ordered for your access; they are the patterns that trigger

and interrelate and codify your creative process, give you something to hold fast to from within yourself to replace the fixed "imported" logics and rules of all your initial influences and to honor them as such at the same time.

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The ways I have seen Braxton use this chart in his work reflect its messages. It began and endures--as do all of his literate/graphic devices, including scores--as a way for him to secure and strengthen his own grasp of his (oral-aural) musical-creative processes; as such, its fixedness mediates the uncertainty of unprescribed improvisation and composition, provides him a "ground" in "mid-air" on which to "plant his feet." [10](#)

This use of the chart is not one he expects others to enter into with him in exactly the ways and to the degrees he does alone. He makes it available to students and the musicians he hires to perform his works, and he speaks openly about the way he thinks in its terms; he uses it to stimulate student improvisations in the classroom. The few students most interested in and aware of the concepts and history of "new and improvised music" and Braxton's role therein, as well as players/composers that are more colleagues and peers than students, apprentices, or journeymen, understand it as an abstract they should match, rather than strictly follow or mimic, with their own similar but differently personal versions, whether such are set to paper or simply sufficiently internalized to function as an effective compass--the body itself as score, as text--through ever-uncharted musical terrain. (This, in a nutshell, is what distinguishes the chart, for all its resonance with both "cosmic" patterns and blueprints and "scientific" language, as a non-absolutist narrative, thus firmly planted in the postmodern mid-air.)

Not pictured in this version of the chart is its recent development of its sonic units into both mythical and anthropomorphic characters and their "houses." Thus (what Braxton calls) "the first house" is the "house of Shala," is Shala herself, and springs from the sonic unit "long tones." These characters/houses--sprung fullblown, name and all, from the artist's creative fantasy, not conceived as allegory or metaphor in any sense--provide the dramatic personae of the opera libretti Braxton writes to his own music, all of which is another story. The important point about them here is the degree to which he has made the musical elements with which he works in his (humanity's) own image, invested them with a personal mythos and life. He often speaks of these characters and their houses as set in a virtual cyberspace--could be the imagination, could be its extension from human mental to computer's visual field--as real to "the friendly music experiencer" as some "Jurassic Park of music," where fantastic, marvellous sonic beasts and scenery make up a terrain threaded by roads connecting cities. This comes across simply as the expression of his wonder at natural and cultural life, both inner and outer, and the way music (and possibly computers) can simulate and even evoke that life.

In the fall of 1993, Braxton enrolled as a student in a Wesleyan course in Computer Science; his notes and projects for the course tell of his desire to computerize his system in such a way that he could have his K-2000 synthesizer produce, with combinations of his own samplings and sound syntheses, his "sonic units," sequence them through the "geometric schemes" (hopefully with capacities for interactive interplay with improvisers playing through breath- or pitch-controlled MIDI devices), and identify, categorize and file the results (after any desired alterations) as the "identity states." These files (again, with some Braxtonian extensions of notation technique, also computerized) were to be played and improvised against (or with, interactively). This computerization project has yet to go beyond its initial steps--more pressing demands have simply prevailed--but it remains a long-range goal. Those initial steps include a current piece in progress built more from sequences of samplings and synthesized soundfiles than from any kind of algorithmic programming, the composer himself organizing a non-interactive piece available to include in a larger musical event.

The thoughts Braxton worked out in the computer science class he took and the visions he holds for the future of his music reveal both an animism and a humanism underlying the technocratic language and schematic of his chart that serves as a ground against the commonly expressed alienating aspects of computer music (and technology). The following excerpts from his class notes convey that outlook. I have selected from them with no presumption of entering (or entering Braxton) into professional discourse about Artificial Intelligence--and that point bears emphasis and explanation.

If Braxton were an assiduous student of the discourse and debates that have emerged over the last twenty years in the work of people like Searle, Fodor, Lakoff, Johnson, the Churchlands--materialism versus dualism, strong (or objectivist) versus weak AI, the challenges to "self" and "identity" brought on by consciousness studies--I would follow him down that trail like a responsible scholar and discuss his own contributions to that discourse. To immerse myself in it without such a cue from his work, to evaluate the latter in its terms would make for a legitimate paper, but not the one I am offering here; I seek rather to convey a sense of Braxton's own vision of computerized music, of what backgrounds and informs that vision, and of the role of musical notation (in its widest sense, including texts and graphics, encompassing the Tri-Metric chart) and computer programming in that vision.

However, I cannot resist mentioning in passing the work of Australian<sup>11</sup> Jeff Pressing (1988), who declares his theory of improvisation to be "the first proper (though by no means necessarily correct) theory of improvisational behavior in music" (129). He found particularly useful to his own model material from Artificial Intelligence studies, from its branch called "knowledge representation." "Knowledge representation in artificial intelligence is based on many ideas, including indexing, conceptual dependency, hierarchies, semantic nets, multiple representation,

blackboards (actually a type of interprocess communication), frames, scripts, stereotypes, and rule modes... *With respect to improvisation, many of these are more suggestive than readily applicable...* Hierarchies have been discussed previously. Semantic nets are perhaps more promising: information is represented as a network of nodes connected to each other by labelled arcs, each node representing an object, event, or concept, and each arc a relation between nodes. Such a graph could be drawn for musical objects and events, but parametrically tuneable processes are not easy to represent, and this is a serious drawback... " (151, my emphasis, to bolster the point argued next). Braxton's chart resonates with "such a graph," without the "serious drawback," because for all its resemblance to engineering schemata, its parameters, while subjectively precise, are by virtue of *that* precision more poetic and mythological than scientific; thus, like music, *its* "parametrically tuneable processes" are *impossible* to represent--but not to metaphorize, evoke, and provoke, both for and in both generation and reception of music).

Braxton's class notes, following, convey the composer's thinking and feeling about this technology and how it can serve and be served by humanity.

#### YES, COMPUTERS CAN THINK (OUTLINE FOR DEBATE IN CLASS): INTELLIGENCE DEFINED AS THE LOGIC OF ANIMATE BEHAVIOR

- A. Every state (including "consciousness") is consistent with the dynamics of its tenet context.

1. human perception is a condition that doesn't necessarily express all of the dynamics taking place in apparent physical and/or vibrational reality.<sup>12</sup> That is, the experience of existence transcends any two-dimensional construct but rather is a multi-dynamic experience.

2. John Muir wrote of everything in the universe having a connection. His realization is relevant in this context in the sense of understanding the role of corresponding logics as a necessary component in the definition base of the next thousand years.

B. The concept of Artificial Intelligence is not separate from the challenge of logic structures and "states of recognition." This field of research is too dynamic to be contained in any one context between human and/or trans-human.

1. The Church-Markov-Turing thesis in my opinion limits the domain of the

discussion and wrongly assumes that there is nothing unique about extended computer dynamics, in their own right, separate from humans.

2. I agree with Wilkes that there is no reason to assume that computers should operate in the same way as the brain; that the use of analogue discriminating circuits (inside of neural net configurations) can be included in the new models . . . human perception is only one example of consciousness, and the study of AI should extend into trans-human states and goals . . .

. . . EVERY STATE IS ALIVE

C. By alive in this context I refer to understanding, consciousness, language and mind, as well as "intensity," as conditions that establish a state of existence/consciousness.

1. Minsky says "consciousness" has an evolutionary role that includes creating a model of itself for survival (external observer, "talking to oneself" . . . )
2. Consciousness involves representation models . . .
3. *This viewpoint also extends to animal and plant consciousness as part of the greater consciousness existing on earth (including rocks and minerals)*

AS SUCH, THERE ARE DIFFERENT WAYS OF BEING, AND EVEN HUMANS ARE NOT ALWAYS EVOLVING IN THE SAME DIRECTION (OR WAY) (emphasis mine)

That should suffice to convey its sense and my point. The passage I emphasized evokes it all for me: it is the statement of an animist, or a panentheist. It also bespeaks an instrumentalist's rapport with his horn. When he pours so much of himself into this "inanimate" metal tubing with keys, it fast becomes a "she," a beloved companion, a physical design (like himself) with a mind and voice and moods and surprises of her own. Not only medium, but expression--the poet's lines, the novelist's characters, the painter's images--goes beyond the creator's self into a life of its own.

It is necessary but not sufficient to say that that life is an extension of the creator's; it is truer to the experience and insight of most to say that such life is also the offspring of an engagement between the creator's life and that of some other part of the universe. Not to acknowledge this is scientific hubris, and is, I suspect, the fallacy that informs any view of Artificial Intelligence that posits in it an autonomy from its creator (the same autonomy from his creations a creator might fallaciously assume for himself).

Computer technology, then, as homunculus, a simulacrum of its human maker that, however bereft of this or that crucial definitive trait thereof, commands the fear, respect, and affection of its maker for its mysterious suggestiveness of an equal consciousness, of which the maker is bereft. [13](#)

I suggest that this model--surely the one favored by the Star Trek scriptwriters, and the most interesting science fiction writers, including those who have attracted scholarly attention, such as Phillip K. Dick--itself suggests why "strong" (objectivist) AI scientists such as Schank (1977) and Winograd (1986), and their counterparts in more general discourses (positivists, behaviorists, grand narrativists) and in music theory (the "total serialists," for one example) have come to seem inadequate in their overadequacy: the best systems and uses of musical notation are those which spell out only so much information, leaving most to be filled in by their user.

Anthropologist Edward Hall discusses such systems and uses in his terms of "high" and "low context;" high context (HC) systems are the sketchy ones that presume a rich base of knowledge in their users, low context (LC) those which spell every detail out, presuming no such knowledge. The way Baroque improvisers used figured bass notation, and the way jazz players use lead sheets, is HC; a through-composed score, with dynamics, mood, tempi and other aspects spelled out, to be interpreted exactly, is LC.

The area of AI discourse that resonates with Braxton's composerly interest in computers in music, then, would be that which keeps human agency at the helm, even if its fate there is to go down with the ship--decidedly not that which fetishizes the prosthetically superior (to brain) power to "think," the area of technocracy; neither is it that which fetishizes the prosthetically superior (to body) power to work (eg., in music, the drum machine, or synthesizer as simulation of acoustic instrument, or as self-sufficient composer), an area akin to slaveholding aristocracy for its lack of respect of the machine's life. (The latter is perhaps more tellingly pictured by the musician whose engagement with his instrument is that of, say, one who makes rolls for a player piano rather than that of Fats Waller, Art Tatum, or Cecil Taylor--or even Glenn Gould. Braxton, by bent as reclusive as gregarious, has no problem with the computer as isolater, sees rather as efficacious individuals wired alone at their terminals making real-time music/communication in virtual communities, along with their "real-space" such activities.)

When and if Braxton does premier a serious work built around and with computers, it may not be something that would be of great interest (apart from that in his name) to readers of *Perspectives in New Music*, or of Robert Rowe's *Interactive Music Systems* (1993). Rather, as has been the case all along, it will more likely attract the more generalist attention for the ideas and implications evoked by his musical statements. Most immediately (and superficially), the

idea of the computer/engineering nerd as hero; though that image doesn't really fit the composer's personal affect, it is one that he started evoking when Apple was still only a twinkle in Bill Gates' eye. More substantially, it will fall naturally into the area defined by those who are players and composers first and computer/synthesizer freaks second: the lineage from Stockhausen to David Tudor and Cage to, closer to Braxton's own circles, Americans George Lewis, Richard Teitelbaum, and David Rosenboom (all former "bandmates") and Europeans Tom Leeds and Georg Katzer.

This lineage houses comfortably the Western art music, jazz, and experimental music traditions within its aesthetic, including a strong sense of individual human voice and vision, and rights and power. It never loses a sense of not only the sound but also the "brains" of AI as an instrument, no more or less alive than the humanity it extends. Braxton's Tri-Centric diagram above, too, eminently matches this aesthetic, sheerly for its structural, modular features, more so than many that might have been hatched in an acoustic/jazz/Afro-/improviser milieu, without crossing the line from the artist's personal poetry into the technocrat's objective science.

Some wags have referred to AI as "Artificial Stupidity," to deflate its mystique as sentient Frankenstein--but Braxton's sympathy for it doesn't seem motivated by its computational so much as by, naturally enough for a musician, its sound-synthesis prowess. Like Sun Ra's, or Miles Davis's fascination with the sound he could get from a simple triad on the keyboard (Miles called it the "world's chord" in Troupe's biography), Braxton's delight in the sounds that can be made electronically is an extension of that he has for the various acoustic instruments and their combinations. And if wind instruments resonate with breath, and percussion with heartbeats and other physical cycles, and bowed strings with vibrating vocal chords, electronics evoke the electricity of the central nervous system itself, and of space beyond the earth. A drum is stupid too, but only in stupid hands.

How is all this applied to musical discourse, and to the larger cultural discourse to which music scholars ply their special issues? Braxton hints at his answer in another part of his notes when he expresses his dissatisfaction with most computer music:

With the exception of a handful of composers (notably Karlheinz Stockhausen and the American composer George Lewis) I have not been very impressed with computer music--and this is especially true for the interactive computer experimental musics. For my musical taste, much of this music was either too mechanical or too predictable.

Having some knowledge of the specifics of his likes and dislikes, I understand "mechanical" to mean overdetermined (inflation of human agency) and "predictable," paradoxically, underdetermined (deflation of human agency, such as when the rhythmic and sonic vagaries of

some natural process or mathematical premise are harnessed as music, with little or no human engagement other than conception and initiation of that which plays itself out). Both of these extremes correspond to theological positions--Calvinism (specifically, the doctrine of predestination, God's foreknowledge of the future, thus the absence of human free will) and Deism (the doctrine of the "watchmaker God," who creates then withdraws from the creation to let it play out its own life), respectively--that have indeed played major parts on the American stage, yet have become historical cul-de-sacs over time, largely through challenges posed by the African American (and Native American, but that too is another story) presence here. Paganism, animism, and what we might call "humanism" provided the rationales and impulses that provoked the mystical, occult, Millennialist and Pentecostalist turns in American culture--in other words, those aspects of the Judeo-Christian mythos and tradition that stress the union rather than separation of spirit and matter, of heaven and earth--diverting it from those Enlightenment theologies (if we grant Calvinism as a reaction to secular humanism) that were still essentially Platonic in their spirit-matter split.

Such a revelatory rush merits a stock-taking moment. Braxton has been so interesting to so many more writers than so many other musicians not because he's unique in his concerns so much as that he has been unusually concerned with communicating them, both as interviewee and as writer himself. My goal as his student, colleague, and writer has been to honor what he's communicating without parroting it; thus, the "humanization of artificiality" I ascribe to him is as much me as him, as also my comparisons of his aesthetic and work with theological tenets. Such goals being achieved successfully in my book on him, he and I agreed that we didn't need to do an interview for this paper, that I already knew what he would have to say, and that the real message in any piece by me lay in what I had to say. Readers may yearn for more--to crack the Esoteric Mystery, to get The Word straight from the Master's mouth--but if when they get such dime-a-dozen answers, they don't look to their own mysteries and words and mouths, and so they don't get Braxton's real truth. And if they do look to their own truths and find therein a neutralizer, a refutation of, an arsenal and weapon against Braxton's...they also don't get it. Just as they don't get Bach's or Schönberg's or Charlie Parker's if they don't dance and discourse with same like Counselor Troi might have a friendly waltz with Commander Data. My overview of Braxton would be overstepping if I presumed to answer the central question facing not only Braxton, but all of us: why this way, and not another?

The abovementioned George Lewis, a longtime band member and fellow AACM associate with Braxton, makes points akin to the one I just made with his terms "Afrological" and "Eurological" in reference to the improvised music of Braxton's era ("after 1950").

These terms refer metaphorically to musical belief systems and behavior which, in my view, exemplify particular kinds of musical "logic." At the same time, these

terms are intended to historicize the particularity of perspective characteristic of two systems that have evolved in such divergent cultural environments. (1996: 93)

Lewis' essay pinpoints historical instances of Eurological views of both composition and improvisation that suffer (in our shared opinion) from an imbalance between the extremes of (tyrannically egoistic) overdetermination and (irresponsible to historical, social, and personal context) underdetermination. He cites Rose Subotnik (1991) for what he sees as her affirmation of his favored Afrological approaches (among whose he numbers Braxton's). Discussing the Eurological distancing of "personal narrative" from "improvisative activity," he writes

In some respects the distancing of personal narrative updates the concept of a post-Kantian "autonomous significant structure" identified by Subotnik in her essays on contemporary Eurological music. This autonomy is based on the assumption that "humans can build structures or domains that are complete and meaningful within themselves." Moreover, according to Subotnik (266), "the recognition of validity in such a structure is not thought to depend on the particular identity, power, habits, or values of those who create or receive the structure in question. Rather, validity is supposed to inhere in the ability of a structure to carry out its own laws with consistency."

Subotnik believes that this ideal of autonomy is a fiction; the popular understanding of Gödel's theorem concerning the impossibility of a logical system's self-description in its own terms would seem to provide some corroboration. (118-19)

By contrast, Braxton has asserted that the function of form is to engender certain contents, which trigger certain responses--a working definition of form as generative of (its own) soul, but one mediated by his idea of form as cast in plastic rather than stone. An example of that from his own work is his exhortation to people to learn how to play what he writes note for note only so they can then riff, signify on that, like they do, say, on the blues.

In sum: the sounding body produced the chart, gradually, over time, of a beginning/developing/ending musical-creative process; the chart keeps evolving as a generative device, like new versions of software; the chart then engages the body to produce more statements in sound. One body writes a program in order to then write many files within it.

Musical notation is either High or Low Context (per Hall); total serialism is LC, so is post-Baroque "classicism" (*Empfindsamkeit*): things are spelled out. Medieval and Baroque scores, many contemporary unconventional scores, and jazz lead sheets are all HC: people know what the discourse is and bring their own two bits, using the literate/graphic media as triggers and memory aids.

Braxton scores are often a mix of both, but the chart itself is decidedly HC, as is, by definition, any program designed to generate statements, pieces, events--the context in this case being any and every person's idiosyncratic creative process. The interest lies in setting up "tuneable parameters" to be engaged by agents (environmental, outside the system, including humans, but also weather, or other physical phenomena, which, since Jung and Pauli and the introduction of "synchronicity" to our intellectual vocabulary, we must hesitate to call non-sentient) to produce results that are not only unpredictable but more and/or differently informative than the program itself. Each of these statements is, by comparison, always LC, because they are actualizations, realized specifications of potential. Whatever part spontaneity and chance plays in the *process*, the *product* is a statement that stands, in media or simply in time, out from or falls back to random, chaotic potential.

Form, then, as artifice, content as intelligence, and both as inseparably one. It is fine to separate them, Platonically and practically, into intelligence as the abstract, supersensible Ideal (nous) and artifice as its Real (sensible) Expression (phenomenos), as long as we remember the problems of mind-body dualism Platonism has brought to the West, and supplement it with all its conceptual opposites history has supplied us--most notably, here, those from Africa, animist worldviews that sync up with the West's pan/panentheistic thought and tradition more than its transcendental theism. Why supplement rather than replace? Because it is not an either-or situation; both are complementary aspects of a universe that is rationally paradoxical; both are true, neither are true, and if this strikes you as more mystical or poetic than scientifically rigorous, go catch up on your theoretical physics.

Braxton understands this paradox, and has put it at the center of his *oeuvre*. The translation of that *oeuvre* into thinking about AI and use of computers goes beyond the fruitless issues of seeing the paradox as a war rather than a marriage and into the realm of human/homunculus, art/trick, and trick/trickster.

The paradox is conceived as a war--a win-lose proposition--precisely when one or the other aspects is seen on top of its complement, allowed to dominate it. Thus we get the oppressive-to-murderous transcendental theism or the equally noxious materialism that has plagued us. As a marriage, and one decidedly of equals, bringing different things to a common table, the paradox necessarily grants sentience--intelligence--to material. Humanity itself is sentient material; we can see AI as dumb extensions of our individual and collective consciousnesses, just as we can see the manufacture of musical instruments and other artistic media and the production of statements therein--or we can see all of that as an instance of passing on some intelligence we ourselves received from somewhere, resulting in our own individuation and identity, to other parts of the material universe, outside our bodies/egos, resulting in their sentience/individualism/identity. Again, both are true, neither is true--otherwise, idolatry of

some sort rules.

The trick *lies* in the juggle; the trickster *knows* the juggle.

Part of the genius of Braxton's system lies, for me, in its incarnation of the most visceral personal investment as that part of the literate terrain--German Romantic scientific rationalism--most expressly cultivated to abstract subjective personality into objective reality, and that into universality, all as part of the *natural* (scientific) rather than some *supernatural* (theological) terrain. It stands, in the milieu of American jazz and experimental music traditions, as a humanization of the very concept of artificiality in its most potentially dehumanizing forms. In succeeding so well at that, it evokes suggestions of happy rather than awful fulfillments of the age-old mythical dreams of the creation of life "in a test tube," and of a technology with its own life and agenda. In doing so, it underscores the human animal as the (successfully individuated) creation of some other intelligence--human *as* homunculus--thus approaching mystery through, as it were, the back door (of immanence, as opposed to the front door of transcendence).

In more concrete terms, to play Braxton's music, especially with him, is to be confronted constantly with the very idea of universal principles and ideals and with the challenge of acting in the light (or in spite) of their implications. We constantly have to wrestle "sound" and "silence" with our "voices" to make them "music;" we have to help and support each other in that enterprise, and we have to accept the results as the best we can do, if we do our best, until the next time we try. We have to be comfortable with our tricks, when sight succumbing to faith makes art look like tricks, in an awareness of and respect for the trickster spirit in (specifically, per Floyd's [1995] recognition of the African trickster Esu) this music, for what it has accomplished and therein promises to surpass. We have to see ourselves, for all this assertion of our uniqueness and assumption of our responsibility to it, servants and poor likenesses as well as creators of the music.

Our relationship to the chart, then, if I may draw on one more metaphor from American history, is that of citizens to Jefferson's Declaration of Independence. We accept it as a statement we ourselves might have drafted in our fullest engagement with the musical potential of freedom, in improvisation; we assent to and actualize its principles with our own bodies, including the principle that its fixed aspects mean nothing without the contributions of our fluid spontaneities, that it is our duty as good "citizens" to actualize the potential of the chart not only with elementary renditions of its compositional aspects--blind obedience to law and order--but with our own celebrations of it as our own freedom, including all the debates, amendments, and critical postures demanded by adherence to anything fixed in the flow of changing time. (This goes back to my initial image of engagement with musical styles diverse in time and space as one with sentiences rather than systems; the apprentice and journeyman may slavishly parrot the superficial aspects thereof, but the master will play Bach in a way that will shock you or leave

you cold, not reassure you about what you think you know.)

By analogy, we accept the saxophone as something we can critique as a cold, ugly invention of an elitist oppression and redefine, reconstruct as a warm-to-fiery extension of free human breath; we accept the trumpet not as a stirring voice of imperialistic militancy but as a romp of freedom and power that breaks all chains; we accept the written word (and the written music) not as dead letter of law but as artful suggestion of spirit; even so, we take on computer-electronic technology as yet another organization and employment of material conceived and designed, as was the industrial age's projects, to better our lot, but effecting rather the numbing and enslavement of our mere organic, personal bodies, to turn it to extensions and ends of our own.

This spirit I've met in Braxton's chart calls to my mind this from Frazer (1987):

In *The Winter's Tale*, Paulina, high priestess of creation, makes life and change come about from unchanging, dead stone.

Music, awake her: strike! [Music]

'Tis time; descend; be stone no more; approach;  
Strike all that look upon you with marvel. Come.  
I'll fill your grave up; nay, come away;  
Bequeath to death your numbness . . .

- The stone became a living, thinking, feeling woman. Should we examine this poetic fact with Descartes' scientific method, or should we examine the supposed factuality of science with the methods of literary criticism because that factuality is only poetic play? Beneath these alternatives lurks a duality of temperaments. One favors permanence and insists that anything worth knowing must be predictable; this is the temperament of exact science. The other favors change and insists that anything worth experiencing must be an example of creativity; this is the temperament of humanistic knowledge.

Braxton's contribution is, I submit, the redemption by the latter of the former, handed to a strong culture's weakest parts.

[Mike Heffley](#) || || || || || || || || [Almatour](#) || || || || || || || || [Almatexts](#)

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## Notes

1. *Random House Webster's College Dictionary* (New York, Toronto, London, Sydney, Auckland: Random House, 1996).

2. See Ronald Radano, "Braxton's Reputation" (*Musical Quarterly*, Vol. 72, no. 4, 1986: 503-22).
3. This was Radano's point in 1986, and I found it corroborated by my own recent (1997) research into the European scene, in more than a few interviews with musicians and fans there.
4. Again, I like Radano's grasp of precisely which flower Braxton is, and what the lay of the garden that produced it is (*New Musical Figurations: Anthony Braxton's Cultural Critique* [Chicago/London: University of Chicago Press, 1993: 1-28]). To that general grasp, I would add my own more music-specific points, especially about musical time (*The Music of Anthony Braxton* [Westport CT: Greenwood Press, 1996: 445-62]). Braxton himself, as absorbed in his own work and persona as he can be, is equally aware of and interested in the larger picture around him and his relationship to it. Specific to this discussion of Braxton's Tri-Metric "system" and his chart of it, ahead, I would take care to distinguish it from the absolutist *Kosmos* of modernism ("grand narratives") and their predecessors (religious cosmology)--most notably, total serialism and complexity--even by comparing it to them here in passing. Its (I argue) more successful aspiration to universal principles is rather that of an artist steeped in subjective, local-personal expression. Indeed, that is what sets it apart from the discourse I link it to here, Artificial Intelligence, as I will explore in the text.
5. As both "strategem" and "trick" it can stand here for that other aspect of Braxton's output for which he has been both praised (as insightful and authoritative) and damned (as affectatious and solipsistic)--his way with words, spoken and written, in interviews and in his own self-published writings about his music and related historical, cultural and philosophical issues; and with the graphic devices he has also used in print media, to convey his own visualizations of sound and concept (see Anthony Braxton, *Composition Notes A, B, C, D, and E* [Hanover, NH: Tree Frog Music, 1988]; and *Tri-Axiom Writings 1, 2, and 3* [Hanover, NH: Tree Frog Music, 1985]).
6. This word emphasizes rules and pedagogy thereof, though as I use it here it is also suggestive of "historical style." I mean only to suggest the relatively cursory knowledge of a typical music history education, and of my own cultivation of "favorites" to perform and listen to. For Braxton's own relationship to such history, see my book's first two chapters.
7. Lest this association of Western music historical styles with space-age androids read like whimsy gone overboard, let me re-orient it in discourse about music as spirit possession (say, Rouget 1980), and about the body as having its own instinctive sub-intelligences about such possession (per, for example, Sudnow [1978], musicologists such as John Shepherd and John Blacking). There is no reason why the German Baroque *Zeitgeist* can't be conceived and experienced as a *vodun orishi*, complete with buckled shoes, tri-corner hat and grey wig, possessing a poor white "horse" such as myself. Indeed, as I write, Braxton is presenting his *Composition 173* at The Kitchen in New York, for actors and improvisers, the former representing human "horses" of (the latter's) spirit "riders," a concept based on *vodun* ritual.
8. In addition to my book's fourth and fifth chapters, see a transcript of the lecture I presented, with colleagues John Szwed and Art Lange, to open Braxton's 1994 New York debut of his Tri-Centric Ensemble at The Kitchen on the Tri-Centric Foundation's website, <http://www.wesleyan.edu/music/braxton/ablect>.
9. Ah, but there are thirteen geometric schemes...and that one anomaly, a digit away from perfection, satisfies your sense of reality more than its absence would.

10. "Feet firmly planted in mid-air" was one of the tongue-in-cheekily telling mottoes of Chicago's Association for the Advancement of Creative Musicians (AACM) when Braxton started out with it in the 1960s.
11. Some of the most thorough and cogent recent scholarship on improvisation--in culture and across disciplines, as well as in music--is coming from Australia, and it is overall very taken with computer technology, both as musical instrument and theoretical model (see Dean 1992, and Smith and Dean 1997). My association with Braxton has led me in different directions--toward explorations of the body and identity--and while the Australians are certainly aware of Braxton's relevance to any discussion of improvisation in present culture, their few explanatory references to him strike me as uncomfortable with and uninterested in the idiosyncratic approach Braxton and I, and others, value most.
12. Braxton's idiosyncratic use of words stands in these examples. They are mostly intuitable; "vibrational reality" here I read as physical reality too subtle to perceive with the senses directly. Those interested in pursuing Braxton's word usage further can consult my book's Chapter Four and the material of its focus: Braxton's own writings (see Sources), with their glossaries of terms.
13. See Frazer (1987: 139-40) for recent research suggesting that organic life may have original links to crystalline structures. I cite this to give body to the animist's (and some modern physicists') notion of not only animals and plants but minerals--the flesh of our computer technology--linked with humans on a continuum of consciousness.

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