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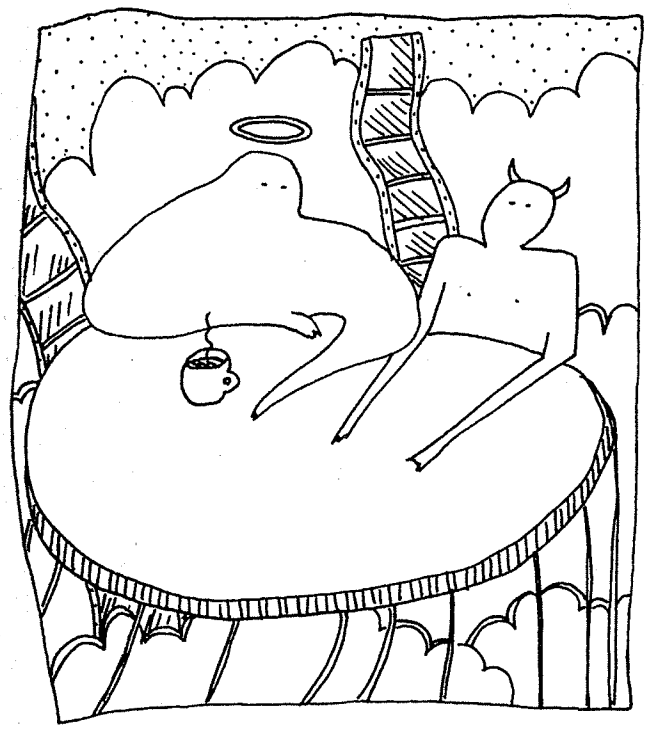
DAVID ROSENBOOM



Interview by Larry Polansky; May, 1983; Oakland.

David Rosenboom, currently Coordinator of the Center for Contemporary Music at Mills College in Oakland, has long been one of the major innovators in American experimental music of all kinds. He has done significant work in composition, performance (as a pianist, violist, violinist, tablist, and with electronic instruments), as a theorist, and as an instrument designer. Among other things, Rosenboom pioneered the use of computers in live performance and the integration of biofeedback techniques in compositional environments.

Larry Polansky: The theme of evolution—of the artist and society together—seems to be consistent in your work, for instance in *On Being Invisible* and in the "In the Beginning" series (8 pieces for various media, including instruments, electronics, film, and text). Is this a conscious development?

David Rosenboom: It's very much related to what I'm doing right now. I seem to have this cycle of about four years where I come to a place in which I have to evaluate myself, or the idea I've been interested in, and start over. I feel that I'm at that stage right now. Consequently, I'm standing back and looking at a lot of my work from over the years, and one reason that I do distance myself is that I see consistencies that I didn't know were there. And now, I'm especially looking at some pieces from quite far back, some pieces from the [Univ. of] Illinois days. Some early electronic pieces, and a lot of percussion pieces. I can identify themes and consistencies that I hadn't before. One of these is a kind of cosmological point of view—that is, my music is very much derived from thinking about nature, and about modeling the universe. I'm one of those people who likes to try and develop a coherent mental model of the universe.

LP: What Jim [Tenney] calls amateur cosmology.

DR: (Laughs) Right. But I do think that one can be a cosmologist no matter what one's discipline. And one can come to visions of the universe that are quite strong, that one then begins to articulate. I'm sure that Einstein had a vision of the universe which he found a way to express mathematically, but I'm sure that the vision was there long before the expression of it. For me this is true in music. To that extent, evolution plays an important part, because I'm interested in how the universe evolves, how we evolve, and how cultures evolve. So you're right, a lot of my music has more or less consciously dealt with the process of evolution. In the recent series, "In the Beginning," there has been a kind of concern with modeling, in this case with proportional structures in music and with gesture shapes that are sort of biologically morphological, possibly even genetic—and with the notion of the activity of modeling itself! Since the proportional modeling is very abstract, I reached a point in one piece, #5 (subtitled "The Story"), where I decided to talk about the whole idea of modeling in itself. For me, the personification of the model was the concept of the double. When Bob Hughes asked me for a piece for the Arch Ensemble, I also had the idea that I wanted to use a film, and that I wanted the film to contain images, very abstract scenes that depicted this strange preoccupation with the idea of modeling. Then, in order to make the scenes more meaningful, I wrote the text, and then I decided to just do them all at the same time—play the piece, show the film, and talk.

LP: Did you make the film?

DR: I made it with George Manupelli. The text depicts a scene in which there are three characters talking, two of them are the spirit characters, which represent the polar opposites of humanity—the maleness/femaleness, the hard/soft, etc. These characters further represent the polar aspects of a single consciousness to which humans have evolved after some cataclysmic event—be it natural or unnatural, we don't know—but a sort of cusp in catastrophe theory terms. These creatures are waking up, the first waking forms of this new evolutionary form. At first they're discussing the phenomenon of their own survival, and then they discover the double, and by this I mean all the forms of the double—the idea of humanity copying itself, the robotic forms (mechanistic synthetic copies), religious copies in the forms of inventions of gods that look like humans, the Don Juan (spirit) form—because I saw in the double, and the big question to them is how in the world did IT survive? For in their minds they created it—now it's a question of whether they did or not. Did it have enough motivation to prepare for its own survival? And the con-

versation goes on..., and the film happens..., and the music, which is the model that I made, is underneath.

LP: By reading your book, *Biofeedback and the Arts*, which is several years old, I had the feeling that in that period you had some concept of the artist as an evolutionary model for humanity.

DR: Yeah, I saw the arts as a kind of science of intuitive thought. The artist can conceive of these radical approaches to evolutionary processes, and is a certain natural and necessary part of evolution—the artist is a product of natural forces.

LP: It's not our fault we're here.

DR: (Laughs) Right. It's built in. I was very involved in the idea of the feedback model, and the notion that we could enhance our naturally self-organizing qualities by creating even more feedback paths than we already have, and this could lead to possibilities for even global feedback—the state of humanity. I saw the idea of monitoring the brain state of an individual, and making that audible, and making that something that organizes musical form, as a model for the notion that humanity must evolve in order to survive itself and what it's doing to Earth—must evolve to a state of consciousness where it conceives of itself as a single organism that lives on the earth. Just as forms of governance of the body deal with the cooperative behavior of the organs and the brain, the different facets of humanity will have to find a way to cooperate in this way in order to make survival possible. Thus, a conception of this single organismic form has to take place. I saw the idea of feedback mushrooming into a global form. Of course, it's politically naive and can be criticized on the same basis that everybody tears down [Buckminster] Fuller, but at the same time these things are worth pursuing, worth educating people to think about. *On Being Invisible*, which is perhaps the most elaborate

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of all the feedback pieces that I did, deals with a sort of ontological evolution, evolution of a single system, of which the person is a part, that goes through its own tendencies towards and away from order, beginning from either precomposed order or from a stochastic, randomly generated beginning. Because of the natural shifts of attention that the person goes through, or volitionally manipulates, sensed by the computer measurement of brain signals, it organizes the musical form. Other pieces were generated collaboratively, like some of the pieces of the Maple Sugar group in Toronto, that we were a part of, which were really involved with the view of the artist in his surroundings—the artist as a creature of social context, and how a group can work as a group.

LP: It seems that a common thread in your work is the use of a very interesting idea of virtuosity, whether it's in the use of high-speed machines capable of complex decisions to restructure your own thought processes, or other performers who can make almost unhumanly quick and complex decisions. People like (pianist/composer) J.F. Floyd, or (master mrdangam player) Trichy Sankaran, people who can do things almost on the order of machines, stretching motor and physiological limits.

DR: Right. The reason for that is, the degree to which you can assume consciousness of a number of higher levels of the organization of the music you're creating, tends to be really high in those people. The ability to give the "go" signal to a generative system that's in your brain that goes to your arm that makes something happen almost without thinking, is somehow correlated with the ability to think in real time on rather high levels of musical information. Sankaran is particularly amazing in this. He's kind of like a high-speed correlation computer, (laughs) in that he can sense the tiniest rhythmic suggestion and build a huge rhythmic composition on it immediately with his drumming technique. That's something that Richard Teitelbaum exploited in one of his brainwave pieces with Sankaran and Barbara Mayfield (who did Tai Chi). Sankaran would hear patterns in Barbara's brainwaves, and he would instantly mushroom them into fantastic rhythmic ideas.

LP: Since a lot of your work has been in either practical or conceptual instrument design, you've been interested in the development of unusually complex interactions between yourself and the machine. The newest of these experiments is the TOUCHE keyboard instrument, and your computer language FOIL. Would you talk about these a little?

DR: Sure. The TOUCHE is an instrument created in collaboration with Don Buchla. It was conceived as a keyboard performance tool that would eventually allow for the implementation of real time algorithmic composition, and which would also contain some of the more interesting advances of computer synthesis in a portable package that could be taken on stage. It consists of three special purpose processors: one for digitally generating waveforms, one for controlling the slower moving musical parameters in an analog manner, and one for making the stimulus/response mapping of the system between the inputs and the outputs. The software is FOIL (Far Out Instrument Language), which is based on the notion of the *instrument definition*, a package of data that at any one time completely describes the stimulus/response characteristics of the instrument, and all of its time varying functions. One can have a library of these, available for instant access, and also edit them and load them. I'm currently working on some enhancements of this as well—to run faster, and also to make possible the real time algorithmic composition in which the performance execution routines will be linked to a "meta-compiler," so that one can experiment with language structures by inputting syntactically based descriptions of languages, and then use these languages to make music with (this will be written with the aid of a compiler called META 3).

LP: You have a lot of background in cognition, experimental psychology, and also in neurophysiology. How has that been an influence, outside of the obvious one in your biofeedback work?

DR: Well. It's another part of the cosmological modeling. I'm interested in how we think, how we form models of the world, and how those models are manifested inside our brain. What is knowledge, from a neurophysiological point of view? How is it stored, retrieved, etc.? Of course the research in that area has provided many inspirations for systems and program design. I think I got interested because I've always been very stimulated by research

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on the brain and its structures, for creating information structures that are resident in music, and also for designing instruments. I've been interested in instruments that imitate the brain and its structure. I've always had the idea that my ideal instrument would be one that was capable of performing research on me, and also adjusting its way of responding on the basis of what I do. Another motivation, also, and a reason that other theorists have been interested in this, is that I've been looking for ways of thinking about musical language that are stylistically independent, not bound up with particular periods of time, history and geography, as most such theories (there are only two or three) are. So I thought that

the place to start was inside the brain, to see how the brain processes musical information.

LP: Two things you talk about a lot lately are the development of formal languages, and the idea of concept spaces.

DR: Concept spaces are something that result from another consistency in my compositions, and that is I'm always making representations of multidimensional spaces in which I consider the elements of a given universe (piece) to be related. They're related by their closeness in that space in some way. There's a piece that I wrote for percussionists Alan O'Connor and William Youhass in 1966, I think, when I was very involved in proportional relationships in music, that involved relating everything to long time units. For instance taking the length of a piece as a fundamental and then, by dividing it up ad absurdum, deriving everything else in the piece—including the color of the lights in the hall (laughs).

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Not that I thought that this relationship would be necessarily organic or perceivable, but I used it to build a unifying model. In that space I worked with spatial mappings of rhythmic ratios, and I worked out a set of compositional invariants, in the serial sense, that appeared in the form of sets of simple ratios, and additive sequences of different kinds, of which the Fibbonacci is one of many.

LP: What was the name of that piece?

DR: It was taken from a distortion of a line from a cummings poem—"The Thud, Thud, Thud of Suffocating Blackness." It was a very bombastic piece, was dedicatd to Ornette Coleman, and I thought I was making a political statement about racism and all that stuff. I think I may change the title. Another piece that I did in Buffalo (1967) for Lucas Foss' group was one where I made a circular mapping of parametric opposites, and the musicians needed to relate to each other through that. The score was composed of a set of symbols that had a dictionary of specific performance actions. That was actually influenced by the semantic differential.

LP: The Osgood thing?

DR: Right, which I had studied in psychology classes at Illinois, because he was at Illinois. I got exposed to it through Ken Gaburo's class in systems theory there, which was a wonderful class. Osgood's book (*The Measurement of Meaning*) is a good example of a concept space model, and I've been thinking about that ever since. As it's developed, it's proved to be such a useful tool that I think it can be built into formal languages, and of course appears in neurological modeling. I think of perception as a hierarchical system, but it's important to understand that it's fully parallel. That is, information on one level is available to all other levels, not just the next level up, which is a fundamentally different approach than the straightforward tree structure. But given that, the sensory mechanisms create some segmentation of the perceptual space, and those become elements. These are mapped into a higher level space, which has a different set of axes. Once those are mapped, changes from one to another are contours in that space. Contours become recognized as features, and shapes in a space on that given level become points in the next higher level space. So the transformation from one shape to another becomes represented as a contour of points in a higher level space. This continues to go up the feature extraction ladder in the neurological mechanism. This has been useful to me compositionally. I'm interested in embedding that structure in a compositional or an analytical language which has both flexibility for the user of the language, who can parameterize that space any way he wants, and which has meaning as well, because it's fundamental to our perception and is therefore not stylistically based.

LP: Very interesting. What about your latest record?

DR: (laughs) I made a 45, which was an electronic version of the U. of Michigan fight song.

LP: Did they like it?

DR: They liked it! (Laughs) Talk about cultural discontinuity! Some producer had this idea to make this record when Michigan was going to the Rose Bowl against UCLA. Somehow he heard my record [*Future Travel*], and he went to Jose Cruz (the producer of FT) and asked him. At first I didn't want to do it, but then as a favor to Jose, who had been so generous in making *Future Travel*, I did it. It was a busy time for me, but I had a four-track and my instruments, so one Saturday afternoon I just made the piece. And they loved it. It came out on a 45 single and sold really well right away, and then they lost to UCLA! It's on the shelf now, but they'll probably bring it out again next year.

LP: Can you talk a little about *Future Travel*?

DR: *Future Travel* is made entirely on the TOUCHE, with the exception of some percussion instruments here and there, and some violin and piano. The music is a result of the modeling process, once again from the "In the Beginning" series, and especially from a part of that process that deals with melody. A melody is represented there as simply a shape—a plot on a graph, which is applied to various pitch sets. These pitch sets come from that proportional idea I worked out. I made a program in which I could access different shapes, and apply them to different pitch sets, causing them to be played in various proportional rhythmic

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relationships—in real time. That is, by touching a key, I would pick a fundamental, and all the pitch sets would be derived, in complex ways, from the undertone or overtone series of that. Then I would pick a shape by touching another key, and that would become a melody. I used rhythmic structures that consisted of cross-rhythms based on irreducible ratios—9/4, 7/6, etc., and I could stop and start these. I found that I could produce such a broad range of musics that had such a wide range of stylistic referents, that I was shocked. I could pick certain proportional sets that could produce a blues, or something I'd never heard before. I was so amazed that it worked that I decided that I would just go into the studio, and gamble that I could create bed tracks with this system that would suggest tunes to me, which I would then orchestrate into pieces. It was a real gamble, since the studio time was expensive (recorded at Zoetrope in SF), but I was real pleased with the result. Kathy Morton, the recording engineer, was instrumental in making this all work.

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