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# The Electro-Acoustic Music of Frederick Lesemann

Bill Alves

Two of the first electronic works Frederick Lesemann wrote at the time when he was founding Treasurer of SEAMUS at first betray little evidence that the same composer was behind them. *Metakinetic Invention* is an abstract, coolly intellectual, computer-generated work while the lush *Mesita Dreams* (also the title of a compact disc of the composer's music) is a tonal, atmospheric meditation that quietly evokes the high desert landscapes of Northern New Mexico. But what draws Lesemann's diverse works together is not the kind of surface features sometimes mistaken for style, but a unique sense of exploration and compositional integrity. With nearly every work, Lesemann fearlessly invents languages anew in order to best work out the piece's unique problems and possibilities, often with a meticulousness and musicality influenced by his work for acoustic instruments.

Lesemann has been a pioneer in electronic music in Southern California since establishing the Electronic Music Program at the University of Southern California in 1970, where he is still professor of music in the USC Department of Theory and Composition. Lesemann studied with Richard Hoffman at Oberlin and Ingolf Dahl during his graduate studies also at USC in Los Angeles. While absorbing the Neoclassical rigor for which Dahl and USC were known, Lesemann also raised eyebrows at the then-conservative institution with his experiments in graphic notation and other emblems of the 1960s avant garde.

In the late 1960s, on the advice of a friend, he enrolled for a short course in electronic music given by Los Angeles composer Paul Beaver, creator of the well-known album *The Nonesuch Guide to Electronic Music*. It turned out that Beaver had been Lesemann's coffeehouse chess partner on many occasions, and Beaver gave Lesemann free access to his unique warehouse studio and collection of bizarre instruments. At the center of the studio was a full Moog Model 3 modular synthesizer with sequencers and an eight-track recorder. After some period of study and experimentation, Lesemann established his own electronic music class at USC but using Beaver's studio.

The first publicly performed results of Lesemann's work in the studio were inspired by a work by sculptor Eric Orr called the *Sound Tunnel*. In 1970 Lesemann used the Moog synthesizer to create his *Tunnel Music I* and *II* for an array of some 200 loudspeakers inside this 50-foot long tunnel that visitors to Barnsdall Park in Los Angeles could walk through. By 1972, Lesemann had established a studio at the USC campus also with a Moog modular synthesizer and with his student Daniel Wyman performed live on this instrument with a percussionist in his piece *MX 103 (M1-3/P(aba1b1a2...))*.

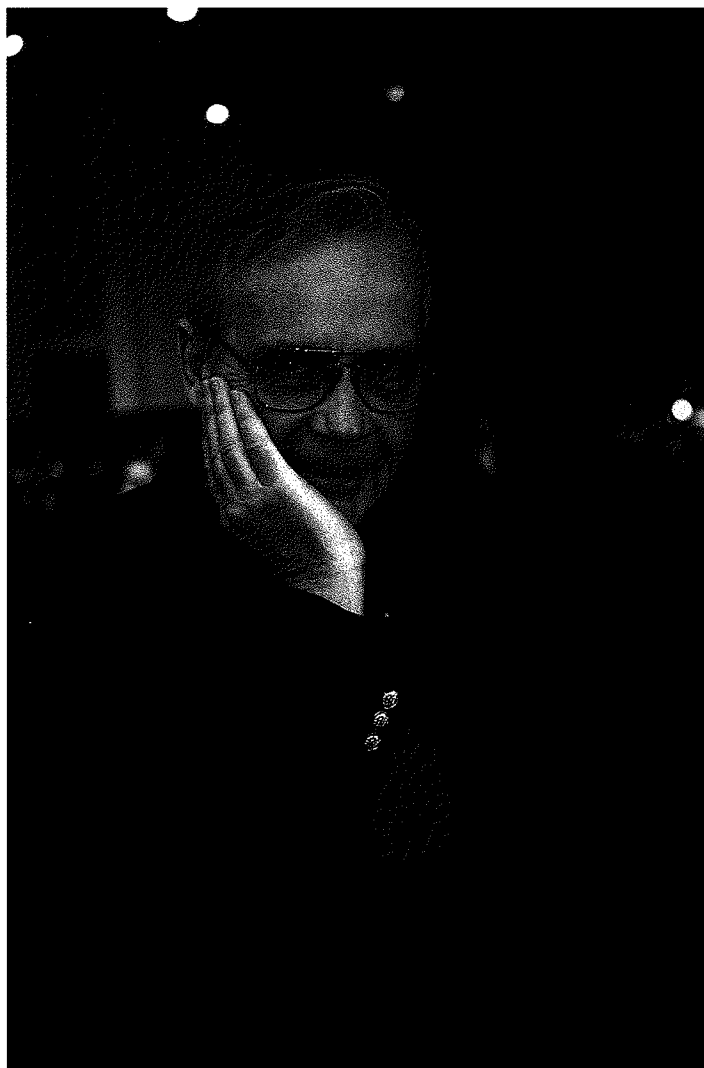
Despite the excitement of these early explorations, Lesemann did not abandon his work with acoustic instruments during this time, writing works for orchestra, chamber works, a cantata, and his popular Nataraja for prepared piano. His first major electronic tape work, *Paradiso XXI* (Five Visions from Dante) of 1976-77, shows the same meticulous working out of compositional ideas and classical structural elements as in those acoustic compositions. An expansive work in five movements, *Paradiso XXI* is symphonic in conception, including a slow movement, scherzo, and finale. This work also reflects Lesemann's humanistic side, including his interests in poetry (inherited from a poet father) and Medieval history.

*Paradiso XXI* uses as sound sources recordings of readings of Dante's work in Italian, English, French, and German in addition to the Moog synthesizer. The 21st canto tells of Dante's ascension to the level of the contemplatives who have left the material world behind. Beatrice warns that her smile, so filled with the radiance of the truth of God, would consume him as a tree is by a bolt of lightning. Lesemann allows us to contemplate these words abstracted through tape loops and mysterious Moog timbres layered atop one another. In particular, the German word for lightning, *blitz*, is thus gradually obliterated.

The second movement, "Angel's Flight," evokes Dante's description of angels cycling up and down Jacob's ladder with circular patterns of sine waves moving in and out of phase with each other. Lesemann

also extends the up and down sine metaphor to the tuning system, in which he substitutes the ratio of pi for the octave, adding the waves up into ethereal multitudes of angels dancing up and down the heavenly ladder. A separate work from 1979, *Adagio Oronato*, likewise uses timbres, a tuning system, and a structure based on an irrational ratio, this time the Golden Section.

Next in *Paradiso XXI* is the slow movement, which uses readings of the line "la dolce sinfonia di paradiso," the sweet symphony of paradise, as its sole sound source. Lesemann extracted vowel sounds alone and layered them into clusters, then precisely preceded each with splices of consonants, creating an unearthly chorus.



*Founding SEAMUS Member Frederick Lesemann*  
*Photograph by Irene Fertik*

The fourth movement, a scherzo, was even more painstaking in its realization. Here the text is a description of a soul appearing as a "lamp of grace" which spins like a millstone at full speed. Lesemann

extracted some 50 individual phoneme transitions from this text and arranged them into a scale based on the microtonal differences between each tiny splice. He then rearranged these fragments into an accelerating canon that whirls around the listener. A scene in which the angels make a sound like no other "heard on earth" inspired the last movement, which, like its counterpart first movement, uses multilingual readings of the text as its source, creating a fitting electronic version of the "peal of ominous thunder" described in the text.

Steve Reich's early phase music works of the 1960s in part influenced the phase processes used in "Angel's Flight." In 1978 Lesemann created a series of works that, like some of Reich's, used this technique of canonic material gradually going in and out of phase as a process that defines its own structure. Lesemann created the most widely played of these works, *Hammer Phase*, with an electronic concert series that he had instituted at USC in mind. At these concerts, large speakers mounted on the rooftop of the music building would send the electronic sounds ping-ponging around the tall concrete structures of the USC campus. *Hammer Phase* begins with a constant slapping beat (nevertheless rendered more interesting through slow phasing and flanging effects) synchronized with two high-volume riff-like fragments repeated at a temporal ratio of 63:64. It is thus at once repetitive and yet never the same, dance-like but without an identifiable meter. Lesemann used several Moog and Emu analog sequencers carefully synchronized to the "hammer" beat on tape to realize this piece.

In 1977 Lesemann attended the summer workshop in computer music at Stanford University principally taught by John Chowning. Lesemann brought back a copy of the MUSCMP computer music language program developed at Stanford and, with help from colleagues in technical departments, successfully installed it on a DEC KL-10 mini-computer in the applied physics lab. His first piece which used sounds realized with this software was Lesemann's most-performed electronic composition, *Concerto for Piano and Electronic Tape*.

Like many of Lesemann's other works, the circumstances of this piece's commission and performance determined much of its compositional structure. Lesemann wrote it for Arnold Schoenberg's former assistant and then director of the Schoenberg Institute, Leonard Stein, and therefore based it on strict serial procedures. The first movement, in the form of a Baroque concerto grosso with patterns of gradually

expanding fragments, matches the piano with intricate counterpoint from Moog sequences.

As in *Hammer Phase*, a "hammer stroke" whacks through much of the concerto's third movement, but now as a unifying foreground for a movement with romantic bravura, complete with cadenza written with Stein's particular strengths in mind. The second slow movement is the one which uses the computer-generated sounds in the form of gently pulsating clusters of very high harmonics of extremely low (and unheard) fundamentals, which would have been very difficult or impossible to realize with analog electronics. An uneasy tension develops between the equality of tuning that lies at the foundation of the 12-tone method and the tuning of the harmonic series used in the chords.

Lesemann's *Metakinetic Invention* (1984) approaches the advantages and possibilities of computer realization in a more direct way. During those days, computer music composers at USC, dependent on the goodwill and resources of the computer science and engineering departments, would have to immediately download realizations of their compositions to digital tape, which, once or twice a week, could be carried over to the engineering computer lab and played through a digital-to-analog converter.

simple composition of concentric squares. Lesemann's idea was to compose a basic structure that could be realized in different forms with relatively trivial changes in code. For example, carriers and modulators could be reversed or pitches inverted to strikingly different effect with the same score file. Lesemann generated five different versions of *Metakinetic Invention* this way, each quite distinctive and yet with a form clearly in common with the other four.

In 1985, Lesemann was part of a group awarded a USC Faculty Research and Innovation Fund grant to purchase a Synclavier II computer music system. At the time the Synclavier was state of the art for real-time digital music composition. At the same time, Lesemann was spending summers hiking in Northern New Mexico, a region to which he felt a close bond due in part to a family connection to the area. There he experienced a stark and vast desert landscape, articulated with sonic dramas ranging from insects to huge thunderstorms.

Armed with a Nagra tape recorder, Lesemann spent three summers chasing, among other sounds, the perfect thunderclap from the storms that swept through Bandelier National Monument nearly every afternoon.

Page of *Metakinetic Invention*, Frederick Lesemann

Such a large distance from interactive feedback necessarily bred certain efficiencies of concept, which reminded Lesemann of a series of works by painter Josef Albers called *Homage to the Square*. In these works, Albers experimented with different color combinations in a

From these soundscapes emerged *Mesita Dreams*. As the Synclavier at the time had 16 polyphonic FM voices but only monophonic sampling, Lesemann created a thick, tonal texture of synthesized sounds (the counterpoint carefully worked out on staff paper mostly far from the

Synclavier), the voices of which are often articulated by a layer of natural sounds of distant thunder, bird calls, and insects.

His next Synclavier work, *Shotsona*, is a very different evocation of the spirit of the Southwest. An avid reader of Native American culture and literature of the region, Lesemann was inspired by a spectacular recording of a coyote howl he captured one summer. In Native American mythology the coyote, known as shotsona in an indigenous dialect of the region, is the trickster fool whose schemes often backfire. The work's subtitle, "Trickster's Dance," describes the scherzo-like dance made up entirely of one-tenth second digital splices from the original coyote howl.

While related to the intricate splicing of source recordings in *Paradiso XXI*, digital technology allowed Lesemann to combine hundreds of these fragments in ways and with precision that would have been practically impossible with tape. Instead of sequencing the work directly as with *Mesita Dreams*, Lesemann created it entirely through cutting, pasting, and mixing with the Synclavier's disk editing facilities. The large-scale structure is based on the overall pitch contour of the original recording, and the piece on several levels reflects in the ironic but joyful context of a fool's dance of humanity (and technology) in balance with nature. Lesemann also used extremely limited sound sources, mostly a struck stone resonated in a stairwell, to create Zen garden-like meditative sparsity in his *Cobblemusic* (1989).

The theme of harmony with nature as a means to self understanding is also central to Lesemann's longest work with electronics, his 45-minute, 12-movement *water in the boat* for choir, chamber orchestra, two DX-7 synthesizers, and two stereo tapes. The texts, written by the composer, match aspects of the four Greek elements (earth, air, fire, and water) with the four seasons.

As is fitting, the electronics in this case serve the text like the instruments of the chamber orchestra, not as a means to transform text into something unearthly and transcendent of the words themselves, as in *Paradiso XXI*, nor as a way to find an ironic harmony between human technology and nature in the medium of mythic archetypes, as in *Shotsona*. Now the tape parts provide sometimes transformed but recognizable sounds of nature to help express the text and the synthesizers enlarge the orchestrator's palette. Thus the *water in the boat* marks a point when Lesemann treated electronics not as a means for exploration of issues the technology itself creates but for the magnification of

expressive possibilities of conventional instruments and performance techniques.

When one section of the electronics suggested implications beyond the text, Lesemann extracted that idea and developed it independently as *Ordnal's Frenzy*, an 11-minute flurry of FM tones. While entirely monophonic, the notes pass at such a rate to create a harmonic sense (a technique found in some of his acoustic works as well, such as *Nataraja*). In addition, by assigning notes to different timbres, patterns emerge creating what Lesemann calls "the sonic equivalent of a colorblind test." *Ordnal's Frenzy* was his last purely electronic work to date.

Lesemann has often claimed that, given the options, his medium of choice is the orchestra, and for the last 12 years he has turned to that medium as well as chamber and solo works for particular performers. In two of these solo works, he paired the musician with a digital delay, but the delay forms a secondary role. In *L'entracte quotidien*, written for cellist Rick Naill, is an exploration of the intimacy of a player's warm-up and practice, to which the delay forms a contrasting foil, perhaps symbolic of the player's thoughts...*just get along...*, written for guitarist Jim Smith in the aftermath of the 1992 Los Angeles riots, is an ironic and again symbolic pairing of a guitarist's rubato with the unforgiving time grid of the delay.

Lesemann's choice to concentrate on orchestral writing may also have been influenced by changes in the electronic music program of USC. While the early days of exciting new sounds from analog synthesizers and tape, or, later, from early computer synthesis, inspired experimental approaches by students, as time went on, most interest in the studio came from USC's well-known music industry and film composition programs. In 1996, Lesemann passed the studio and electronic music courses over to those departments.

Whatever the medium, Lesemann's diverse output always goes to the heart of why a piece is a piece, why it is written, what it is exploring. Lesemann's music for electronics and orchestras alike work out these concepts with integrity and comprehensiveness, a careful ear for sound, and a heartfelt poetry.