RESONANCE

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FEEDBACK

Writing & music by
Toshimaru Nakamura
Knut Aufermann
Nicolas Collins
Alvin Lucier
David Lee Myers
David Tudor
& John Cage
Rob Flint
Phil Durrant
Matt Rogalsky
Michael Prime
Barry G. Nichols
& Peter Hodgkinson
Xentos 'Fray' Bentos

RESONANCE VOLUME 9 NUMBER 2

Contents

Resonance magazine
FEEDBACK

GUEST EDITOR: Knut Aufermann.

Production team: Ed Baxter, Clive Bell, Daniela Gargiulo.
Resonance logo: Alex Finnegan.
LMC logo: Brian Eley.
Cover image: Brian Eley.

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E:lmc@lmcltd.demon.co.uk
http://www.l-m-c.org.uk
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EDITORIAL

THE WORD 'FEEDBACK' WAS NOT COINED IN CONNECTION WITH music or sound. In general it is the description for processes that sustain themselves by feeding a systems output back to its input, thus creating a loop. These loops are not perfect, they can contain an evolving element, which explains their relevance in living systems. There are feedback processes that for example control the duplication of DNA when a stem cell multiplies. The DNA produces enzymes which in turn facilitate the duplication of the DNA. The two resulting cells do not necessarily have to be exact copies, one might become a liver cell and the other a cell of the ear lobe. I find it difficult to describe this developmental character of feedback with words.

Sound on the contrary seems to be the perfect medium to display feedback processes. With the invention of electronic amplification for musical instruments there suddenly was a simple way of producing audible feedback. Just take a microphone, stick it in front a speaker and turn up the volume. Physicists have given this phenomenon of a sudden amplification of certain frequencies a name: *Resonance*. This issue is dedicated entirely to musicians, artists and practitioners who utilise this machine facilitated feedback in their work.

The CD that accompanies the magazine is a unique collection of music, containing examples of what happens when artists play their chosen feedback systems. Toshimaru Nakamura, Barry G. Nichols & Peter Hodgkinson, Phil Durrant, David Lee Myers, David Tudor, Matt Rogalsky and myself use loops between electronic effect units, exploring their internal architecture. Alvin Lucier and Nicholas Collins investigate the acoustic properties of spaces filled with speakers and microphones. Pentos 'Fray' Bentos mixes basic electronics with electromagnetic feedback between tape heads and speaker magnets. Michael Prime makes the reactions of plants to their environment audible. All of these complex systems are capable of feedback processes (circulation of information) that develop a certain amount of autonomy which subsequently diminishes the control function of the artist. To me this is the fascination of working with feedback: giving up control can allow interesting things to occur.

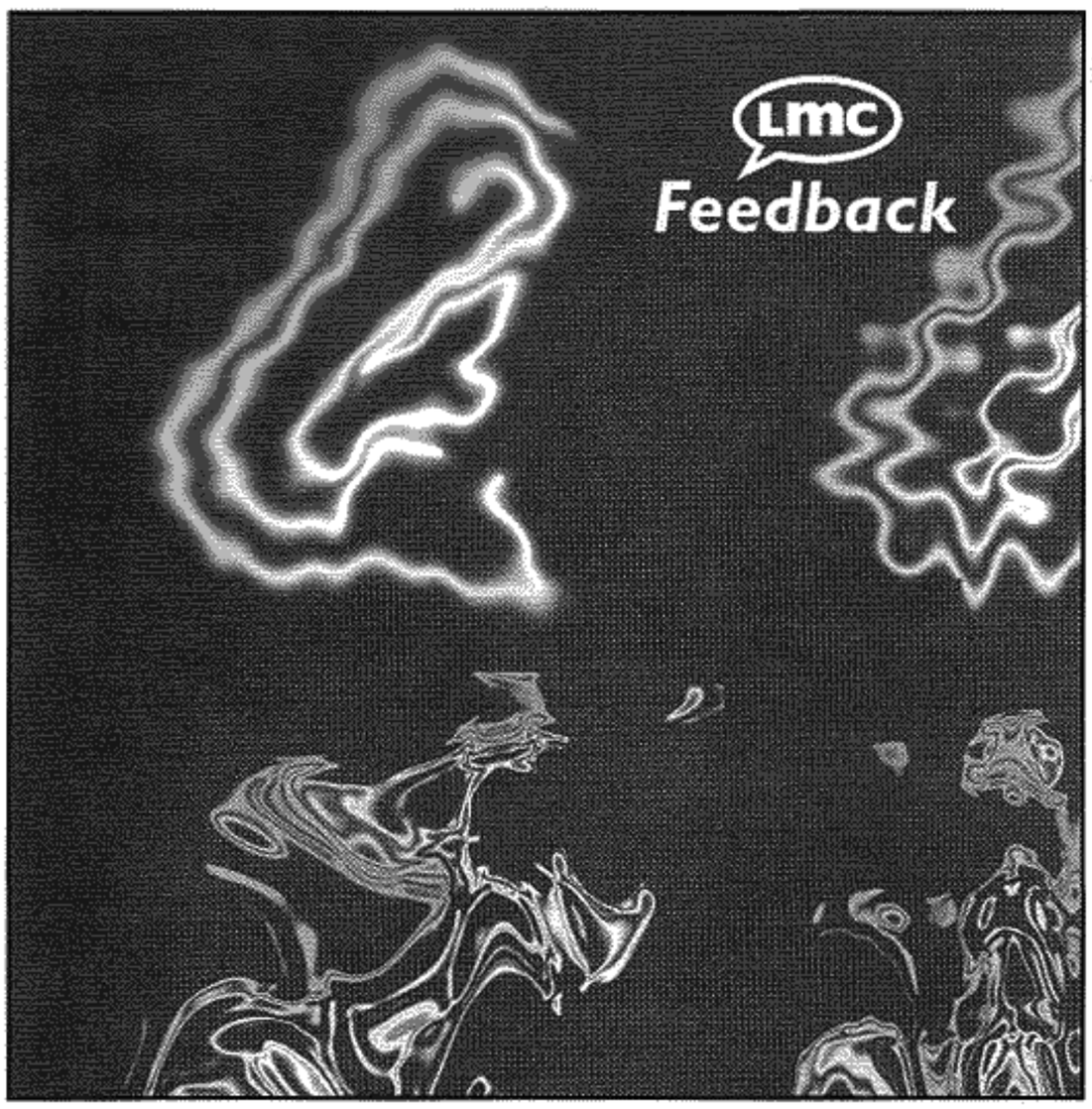
Unfortunately such experimentation with circular processes are not popular with educational institutions. Scientists neglect non-linear mathematics, economists still believe in constant growth, doctors feed hyperactive children with Ritalin and sound engineers can go and buy 'feedback destroyers'.

Circular processes and their implications (for instance the abundance of hierarchical structures) have nevertheless become highly visible in the those areas where linear theories have reached the point of inadequacy. Music is one of these areas.

But there is no need for a 'feedback school', any dogmatic approach to dissect feedback phenomena seems doomed. Instead there should be an open playground for the interaction with sounds, acoustically, electronically, electro-magnetically or by any other means to allow new forms of feedback to develop.

I hope this magazine conveys the curiosity and conviction of all contributors for their way of making music.

KNUT AUFERMANN



RES 9.2 CD

1. **David Lee Myers** *environs 2* [5:52]. Recorded by David Lee Myers, 2001.
2. **Knut Aufermann** *TΩN k4.0v (excerpt)* [6:23]. Recorded live by Xentos at LMCSound studio, London, 12 August 2001.
3. **David Tudor & John Cage** *Untitled & mesostics* [6:44]. Recorded live at Radio Bremen, Germany, 6 May 1972. Licensed courtesy of Radio Bremen. Thanks to Marita Emigholz.
4. **Matt Rogalsky** *Tudor Loops* [4:33]. Recorded by Matt Rogalsky at STEIM, Amsterdam, The Netherlands, 1997.
5. **Phil Durrant** *Sowari for Feedback FX* [4:59]. Recorded by Phil Durrant, 2001.
6. **Michael Prime** *Externum Internus (excerpt)* [7:43]. Recorded live by Michael Prime at the Rising Sun Institute, Reading, June 2001.
7. **ECM:323 & T:un[k] Systems** *Filaments 1-4* [9:00]. Recorded by Peter Hodgkinson, 2001.
8. **Nicolas Collins** *Second State* [3:54]. Recorded by Nicolas Collins, 1981.
9. **Toshimaru Nakamura** *nimb #19-2* [8:00]. Recorded live by Toshimaru Nakamura in Manchester, June 2001.
10. **Xentos** *By the time you get this it will be dud (Symphony of Unstruments)* [5:58]. Recorded by Xentos in London, 2001.
11. **Alvin Lucier** *Music for Gamelan Instruments, Microphones, Amplifiers and Loudspeakers* [15:06]. Recorded by Tom Hamilton and Tim Conklin at Sorcerer Sound, New York. Taken from the album Alvin Lucier - *Theme,* Lovely Music, Ltd. (LCD 5011). Licenced courtesy of Lovely Music, Ltd. Thanks to Mimi Johnson.

Total time: 78:13

Compiled by Knut Aufermann. Mastered by Xentos and Knut Aufermann at LMC Sound. Manufactured in the UK. This CD accompanies *Resonance* magazine Vol. 9 No. 2. Not to be sold separately. CD cover image and LMC logo by Brian Eley. Wallet design by Ed Baxter.

About the Contributors

KNUT AUFERMANN studied chemistry in Germany before he moved to London in 1998. He works and teaches as an audio engineer and performs regularly on customised electronics in various groups and solo. Influenced by his personal practice he has researched the notion of feedback in music for the last two years. This interest will be the theme for his experiments for "Cling Radio" (Saturdays 7pm-1am) on *Resonance 104.4FM* (www.resonancefm.com). Contact email: auferman@yahoo.com

New York born and raised, NICOLAS COLLINS studied composition with Alvin Lucier at Wesleyan University, worked for several years with David Tudor, and has collaborated with numerous musicians and ensembles in many places. From 1992-95 he was Visiting Artistic Director of Stichting STEIM (Amsterdam), and in 1996-97 a DAAD composer-in-residence in Berlin. Since 1997 he has been editor-in-chief of the Leonardo Music Journal, and in 1999, he joined the faculty of the School of the Art Institute of Chicago. His most recent recordings are available on PlateLunch and Periplum.

PHIL DURRANT is a composer/musician (powerbook, live-electronics, acoustic violin). As a composer he has worked with many choreographers including Gill Clarke, Susanne Thomas, Maxine Doyle, Ana Sanchez-Colberg and Sophia Lycouris. As a musician he has an international reputation on the electronica and improvisation scenes. Current projects include the live processing duo with John Butcher, Ticklish (an electronica/live video group), Mimeo (a 12 piece electronic ensemble with Europe's leading electronic musicians), Quatuor Accorde (an improvising string quartet), and a 'reductionist' trio with Burkhard Beins and Ignaz Schick, amongst others. Besides his established collaborations, Durrant is developing solo electronica material for a forthcoming release, and continues to be invited to perform in special projects. He has recorded at least 10 CDs and records showcasing his many varied activities. His website is currently under development, but contact him by email: pdsowari@freqshift.demon.co.uk or visit http://www.shef.ac.uk/misc/rec/ps/efi/musician/mdurrant.html

ROB FLINT is an artist who performs with moving images, often in collaboration with musicians. As well as being a member of the quartet Ticklish, performing with them in various European festivals, he has worked with Sean O'Hagan and The High Llamas, for whom he produced a video, and made live projections. Last summer he worked on the touring show Shin Kyodo, with Paul Hood, Phil Durrant, Toshimaru Nakamura, and butoh dancer Ken Mai. Recently he co-curated motor:show at 'proof' in Bermondsey, showing work by Hayley Newman, Brian Catling, Brown Sierra, Tina Frank, and others. His essay on the artist Gustav Metzger is available in the MoMA Oxford 'Retrospectives' series, and he collaborated with that museum on the MoMAelectronica event last year, at which Ticklish performed alongside Fennesz, Noto, Hayley Newman and Scanner. Ticklish are Rob Flint, Phil Durrant, Kev Hopper, Richard Sanderson. Their eponymous album is available on Grob.

ALVIN LUCIER was born in 1931 in Nashua, New Hampshire. Since 1970 he has taught at Wesleyan University where he is John Spencer Camp Professor of Music. Lucier has pioneered in many areas of music composition and performance, including the notation of performers' physical gestures, the use of brain waves in live performance, the generation of visual imagery by sound in vibrating media, and the evocation of room acoustics for musical purposes. His recent works include a series of sound installations and works for solo instruments, chamber ensembles, and

orchestra in which, by means of close tunings with pure tones, sound waves are caused to spin through space.

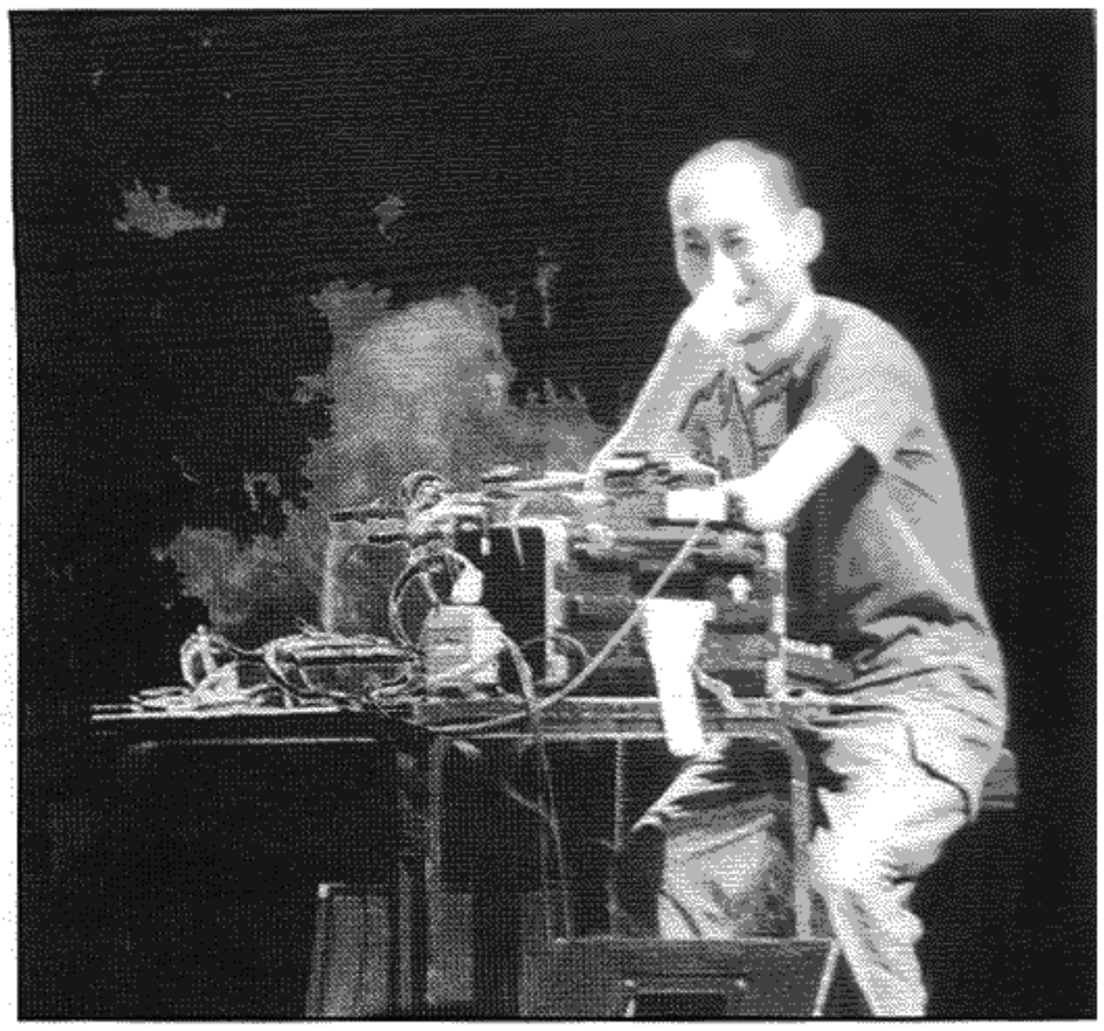
Alvin Lucier performs, lectures and exhibits his sound installations extensively in the United States, Europe and Asia. He has visited Japan twice: in 1988 he performed at the Abiko Festival, Tokyo, and installed Music on a Long Thin Wire in Kyoto; in 1992 he toured with pianist Aki Takahashi, performing in Kawasaki, Yamaguchi and Yokohama. In 1990-91 he was a guest of the DAAD Kunstler Program in Berlin. In January 1992, he performed in Delhi, Madras, and Bombay, and during the summer of that year was guest composer at the Time of Music Festival in Vitaasari, Finland. He regularly contributes articles to books and periodicals. His own book, *Chambers*, written in collaboration with Douglas Simon, was published by the Wesleyan University Press. In addition, several of his works are available on Cramps (Italy), Disques Montaigne, Source, Mainstream, CBS Odyssey, Nonesuch, and Lovely Music Records.

In October, 1994, Wesleyan University honored Alvin Lucier with a five-day festival, *Alvin Lucier: Collaborations,* for which he composed twelve new works, including *Theme,* based on a poem by John Ashbery and *Skin, Meat, Bone*, a collaborative theatre work with Robert Wilson. In April, 1997, Lucier presented a concert of his works on the Making Music Series at Carnegie Hall and in October of the same year his most recent sound installation, *Empty Vessels,* was exhibited at the Donaueschingen Music Festival in Germany. Recently, *Diamonds* for three orchestras was performed under the direction of Petr Kotik at the Prague Spring Festival, 1999, and Warsaw Atumn, 2000. In August, 2001, Alvin Lucier was Guest Composer at the New Music Days in Ostrava, Czech Republic. *Reflections/Reflexionen,* a bi-lingual edition of Lucier's scores, interviews and writings is available from MusikTexte, Köln.

DAVID LEE MYERS lives in New York City. His most recent solo CD, *Ourobouros,* is available on his own Pulsewidth label (www.pulsewidth.com). Myers's third collaboration with Hamburg composer Asmus Tietchens, *Flussdichte,* has just been released on the Disco-Bruit label.

MICHAEL PRIME worked for many years as an ecologist, conserving wildlife habitats in South London. Inspired by his experiences of nature in an urban environment, he has developed a variety of novel organic and environmental sound sources for use in his music. These include the amplified electrical activity of plants, fungi, and humans, as well as a machine which uses the controlled production of tiny bubbles as a sound source. Short-wave radio, bat detectors and other means of amplifying the hidden sounds of the environment are used in both his studio compositions and his live performances. A founder member of the electroacoustic improvisation group Morphogenesis (formed 1985), Prime has also recorded and performed with artists such as Organum, Jim O'Rourke, Eddie Prevost, Max Eastley, David Toop, Geert Feytons, and Emma O'Bong. In 1999, Prime and O'Bong began presenting multimedia works, incorporating video and other visual elements. Since 2001, He has been creating a series of plant bioactivity installations, in which the amplified biorhythms of plants are heard to change slowly under the influence of artificial or natural weather systems. E-mail: mikep@myco.demon.co.uk

The audio works by ECM:323, and ECM:323 /TUNK SYSTEMS on the accompanying CD are presented as a literal representation of a spontaneous, self- generating feedback event, and should *in no way* be construed as a composition. Apart from a modest amount of EQ and filtering, the works are designed to illustrate raw and unprocessed events analogous to those found throughout the natural world. Any fluctuations in signal and channel balance are entirely beyond our control, and all of the sound was generated from two conflicting effects units. Contact ECM:323@aol.com for supplementary material. Our early audio works are documented on the CD ROM — '0Hz',available for £9.99 + p&p from *'0 Hz' CD Rom Journal of Advanced Audio Arts,* c/o Don't Look Now, Threshold Studios, 69b Kettering Road, Northampton NN1 4AW, England.



Toshimaru Nakamura

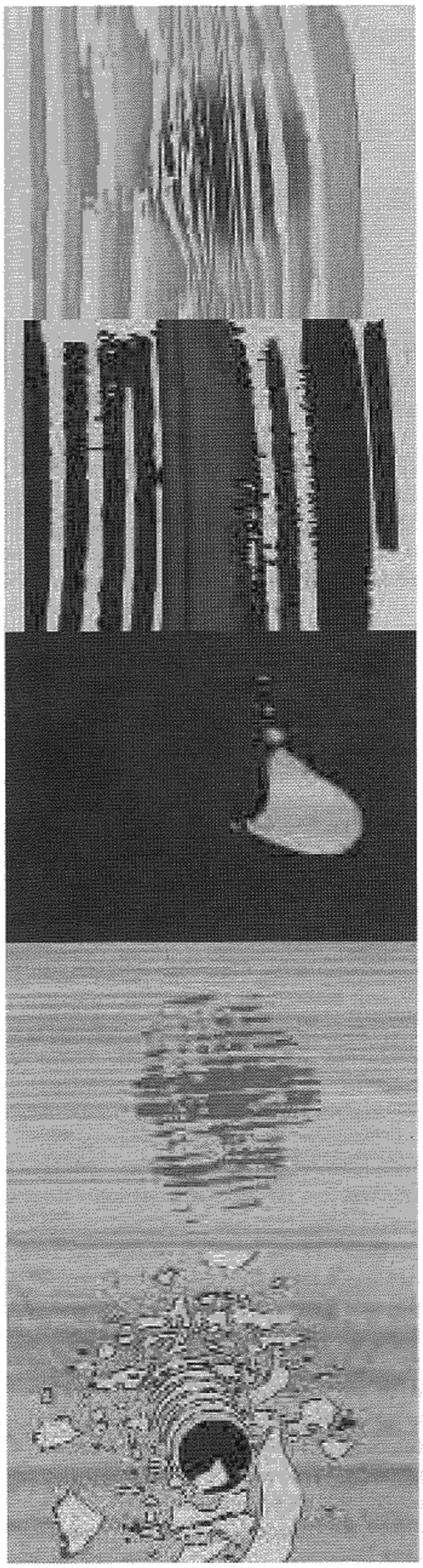
TOSHIMARU NAKAMURA put aside his guitar around 1998 and started to produce the music on "no-input mixing board." Since 1998 he has been hosting a monthly music gathering. first at Bar Aoyama, latterly at Off Site, with guitarists Taku Sugimoto and Tetuzi Akiyama. It has been growing as an important meting point in the Tokyo improvised music scene. He has also been working with dancer Kim Ito as a composer/sound designer for his theatre works since 1996. Recent releases include:
"no-input mixing board 2" (a bruit secret 02).
"select dialect" repeat (cut 005).
"do" with Sachiko M (erstwhile 013).
"Weather Sky" with Keith Rowe (erstwhile 018).
"ATON" with Andrea Neumann (Rossbin Production, rs001).
"Siphono" with Bruno Meillier (SMI, NM210).
Contact: setreset@attglobal.net
Visit www.japanimprov.com/tnakamura/

XENTOS, AKA PENTOS FRAY BENTOS, writes: "I am best described by a recurring dream I have endured since childhood. Through a shoddy dawn I follow a thread that leads me ever deeper into the maze of sound. My mission - to seek out and slay the dreadful sonic beast that lurks at its heart. At every twist and juncture I pass musical genres (some well known, many yet to be discovered) - the sweaty dance fraternity panting like ill-used heffers after a barbaric milk, the rock gods; - a glistening gathering of pointless prunes; the pop brigade - all youth and trousers; even a pack of canny improvisers slumped unconscious over a free bar.

"At last, I enter a dark chamber at the centre of the maze. A trap. Hideous forms surround me. There is not just one sonic beast but a burgeoning army. A terrible scream rips from my throat. At once, all around, the shattering of a million panes of glass as though an almighty fist had torn though the clouds and pummeled a skyscraper.

"Eventually - silence. When I gather the courage to look up, I see that I was standing in a hall of mirrors."

Toshimaru Nakamura
A Few of my Waking Times



Feedback video images: Billy
(*visit* http://gnu.klingt.org)

[text 1]

I'VE JUST STARTED WRITING THIS TEXT ON THE bus heading on the highway to Narita/ Tokyo airport. Using a small computer, a hand-held PC — is that what this is called? This produces tapping sounds when its keyboard is pressed. It's an artificial sound, imitating the noise typewriters make. Am I feeling good with it? I don't know, but I guess the producers of this computer designed the tapping noise to make users feel good. Ergonomic design or something like that, I guess. It's not bad. At least I could tell myself that I'm using my own PC, not someone else's old genuine typewriter, and it's not loud enough to bother others who are travelling on the bus. Those old machines make key sounds unwillingly. A machine makes noise due to its mechanism. But it is a human being that makes them make noise by typing the keys. Collaboration? How beautiful we are! Now, people need noise even from something which doesn't *really* make it. I heard that car producers even design and tune the sound of motor and/or door slamming to satisfy car lovers' egos. And now they are worried about electric automobiles because they are technically very quiet. They are so quiet that they could be dangerous for pedestrians. Oh, I respect and admire the endless effort in technology for 'better' living time. We really need your help from everything to everything, Ms./Mr. Machinery.

The bus is gliding along the highway. Constant road noise tells me that there is no traffic jam, so far. I won't be late for my flight if it stays like this until the end of my journey. The hum from outside or somewhere below the bus makes me sleepy. Anyway, I am sleepy. I woke up this morning quite early. I hope I'm not too tired when I'm on stage. This sleepiness and/or tiredness might turn into some kind of noise inside me. It doesn't take its shape so clearly, thankfully. Or, would it be interesting or maybe useful if it says, 'Hey, I'm representing your fatigue with this sound. Hear me, know me'? Even with some melody, some singing?

No, it'd be terrible if things were so determined. All these road noises, a motor roaring, the helpful and useful recorded announcement through the speakers on the wall in the bus, all these sounds which I have to get through in order to reach the stage where I'm supposed to perform won't affect my music.

[text 2]

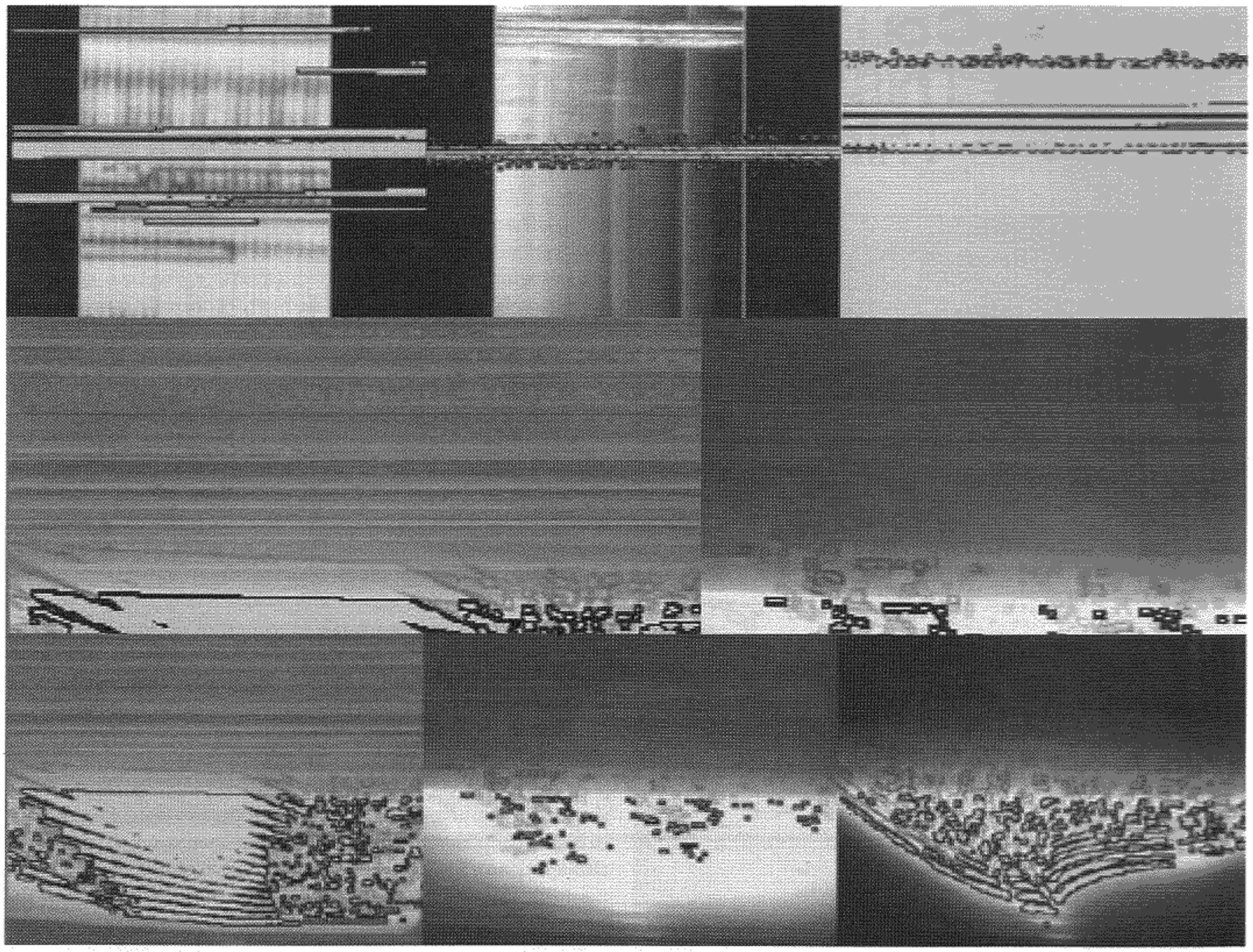
AFTER I INDULGED MY EAGER INCLINATION TO surrender myself to dozing off, now I'm typing again, writing, tapping, laptopping fake artificial electronic imitating mechanical noise. Then I start thinking that what I'm writing is not very important: what is important is the fact that I'm making noise with these tiny actions, only a few centimetres up and down with my fingers. So, I dare try to enjoy making noise. Maybe, just typing keys, not typing for writing. Typing only for making noise. ¡Ä¡Äyqoeucdbayuensivnsvnuhwondudnamq oznfbdusoabf.....

I hope there won't come a day when this order and combination of letters reveals to me any meaning. It should stay meaningless. But at least I've got to know even a no-hard-disc-computer can make sound.

On the airplane, an occasional trip on the seat in the executive class area. The seat is quite differently equipped from the ones in the economy class area which I usually sleep on, the food is different too. But the sound in the room is pretty much the same. Just noisy. I needed just ear plugs to fall asleep. Pairs are even distributed in this area before I take my own out from my baggage. I wear them. As they expand inside my earholes, the sounds are absorbed. I feel like the air around me is captured and packed within their foamy material. Air becomes solid state. OK, I'm pouched in solid air and going back to my sleep.

[text 3]

I WOKE UP AS I FELT SOMETHING HAD TOUCHED my feet. Still in the cabin on the aircraft? As a young executive in the executive class area on the Japan Air Line flight? Ah no, I found myself in a rented bus heading to a festival site in a valley among the Alps in Austria which I am supposed to perform tomorrow as an underground musician. The festival is not an underground one, though, I suppose. Again on the highway. Again on the bus. The same kind of road noise. Is it what all my tour is about? A motor, wheels, wind. Constant explosion of fossil gas in a small metal room. Series of saying hellos and goodbyes exchanged by rubber and hard surface. Never-stopping conflicts between air against glass and metal objects. They are all mingled into the whole of the roaring hum. I hear some details. Small and subtle. But they are all left behind as the bus keeps speeding. Martin who's driving the bus is using window washer liquid. Tiny bubbles are moving upward on the window shield. Those bubbles must be popping and



sparkling. But I hear nothing. I hear some things rattling in the car. Subtle tiny movements above the roar, breathing in somewhere like endangered species. But most of these are covered and hidden under the mainstream noise. There must be many things I am missing. I see an enormous chunk of rock at a great distance. Maybe the edge of the Alps. Standing quite upright. It must be tough to keep its spine like that. Hey, take it easy. Oh no, she/he is mighty enough to keep her/his position. Strong wind must be blowing up there. But I hear nothing. I'm just hearing this constant roar.

[text 4]

So, the sound check. This is something I don't like, but I know it's necessary. Yes, like it or not, you have to take it. OK. I'll do it in the shortest manner. I just check all the hookups, and if my L is allocated to their R, and if it's not too loud for the house. I just don't want to blow up any speakers. That's what savages do. I don't. That's it. It takes only 25 minutes if everything goes well. 20 minutes for building up and wiring up and down, 5 minutes for getting sound. Hmmm, sounds cool. But, it doesn't happen like this all the time. Something wrong happens. OK, let's solve the problem. I just said *if* everything goes well, it takes 25 minutes. I don't mind if I have to do it for an hour. I just wanted to say, every room has its own acoustic. Every house has a different sound system. In some rooms you hear more high. In some others you feel your sound far and sparse. Those differences might change your music in some way. So what? Difference could be fun. I don't see the point spending hours of time just to try to get closer to a sound that you think is familiar to you; or the sound you believe perfect. So I will go and nap some more.

[text 5]

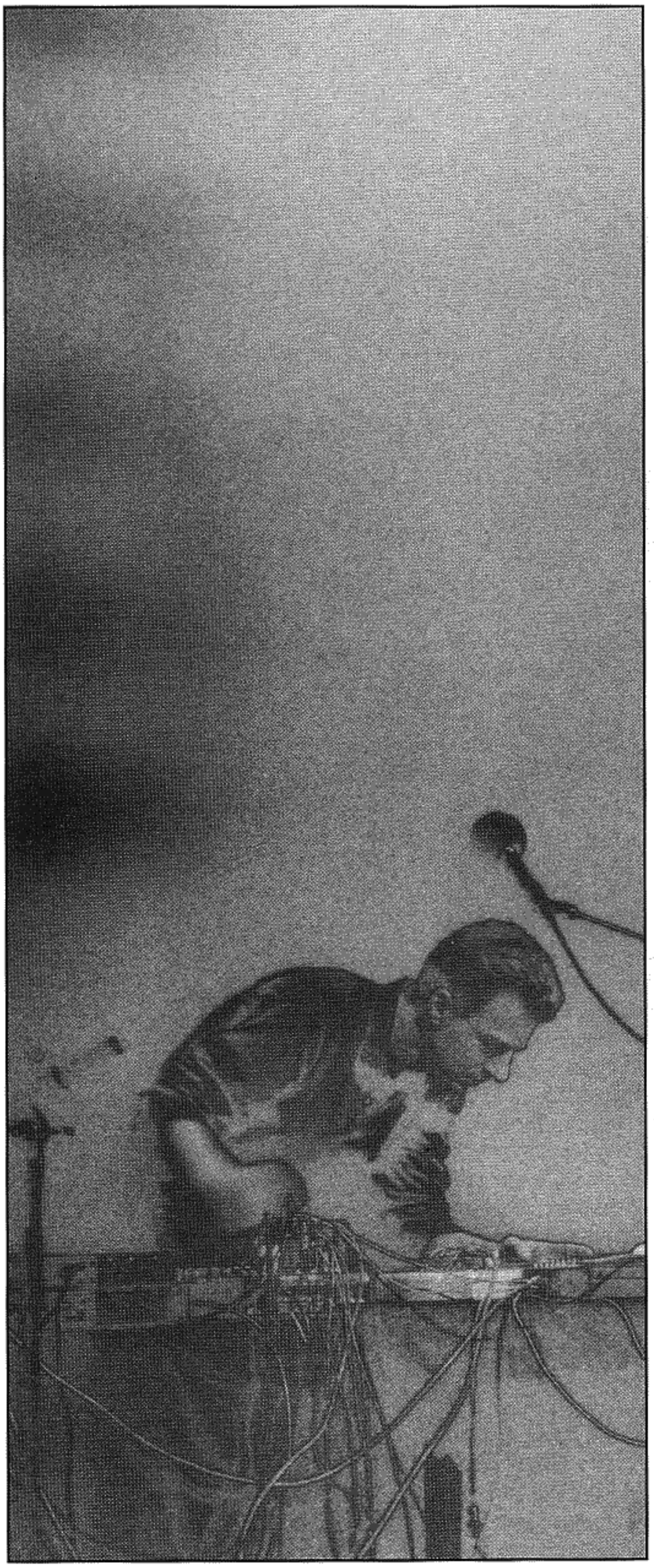
I find myself on stage in front of small electric/electronic gizmos with tiny knobs, lights and buttons. Even right after my nap, I recognize this is what I am here for. The fans of the amplifiers are loud now. Some fans are designed to be switched on automatically when the audio signal reaches a certain level, then turned off when the signal goes below the level. Yes, it makes sense. Amplifiers need cooling when the audio is at a hot level, and when the music is hot, people won't hear fans. But I have my internal problem. I sometimes produce an almost inaudible signal which is electrically fairly hot. Then fans start. You hear only fans. This is quite bizarre, I thought when I first experienced it. No musical sound, but fans. They are not designed for my music. OK then, I'll play the fans. This is sort of fun, I find. I could convince myself that I am enjoying it.

Compared to playing fans, playing feedback is quite unpredictable. You can't be a feedback improviser when you have your brains filled with your big beautiful pictures prior to your performance. If you show up to the venue like that, you won't have any fun. I understand I go onto the stage to get lost. I expect it somehow, in one half of my mind. I often lose my awareness of who does what. One 'who' is the no-input mixing board (my set up for acquiring feedbacks), and the other 'who' is me.

Am I playing the machines? Or, are these machines playing me? Even while I am out of my awareness and/or consciousness, the music keeps going on. It seems like there is quite an equal relationship between these machines and me. And also I find the same degree of equality between my music and me. I don't actually care who is which and which is who.

My skin is not sound proof. My body is permeable and translucent. Why can't sound travel in and out?

NICOLAS COLLINS
All This And Brains Too: Thirty Years of Howling Round



Nicolas Collins

THE OPENING "PWWWWAAAAOOOOIIIIINNNNNNNGGGGGGGG" OF The Beatles's "I Feel Fine" says it all. How could something so wrong sound so right? John Lennon's disruptive skid into George Martin's otherwise carefully controlled production hinted at something that an E-chord alone could not convey. In 1964 feedback was more than just a cool sound, it was a sign that things were not going entirely according to plan. By the standards of a comfortable middle-class American kid, it was a revolutionary sound, a harbinger of more radical things to come: Hendrix and The Who, Psychedelia and Punk, Reich and Ashley. Forty years later, feedback's rebel stance may seem anachronistic in pop music, but thanks to the laws of physics it remains a provocatively unstable and haunting musical material.

As a composition student at university in the early 1970s, I was obsessed with feedback, and almost thirty years later I find myself returning to feedback in times of indecision. Having absorbed Cage's maxim that "any sound can be a musical sound" by the age of 18, I found myself quite unable to choose any one sound over another. Feedback — the Zen-like infinite amplification of silence — became my pathway out of this stasis, and was central to a half-dozen pieces I produced while a student of Alvin Lucier. Feedback conveniently mapped the acoustical characteristics of any space (its resonant frequencies, reverberation time, frequency balance) into a sonic portrait, a site-specific raga — a fortuitous collusion between the methods of Cage and the concerns of Lucier. Turn up the volume and let physics do the rest.

Feedback, moreover, revealed links between electronics and acoustics, between circuitry and instruments, between structure and sound. The familiar, screeching, runaway gain of "positive feedback" manifests itself overtly as sound; but the concept of "negative feedback," which is central to machine control (the governor on a steam engine), cybernetics (self-regulating systems) and audio electronics (compressors and limiters), can also be made musical. In "Nodalings" (1973) I used Sony TC152 portable cassette recorders as outdoor amplifiers, placing them inside dry culverts and wiggling microphones to "overblow" feedback harmonics of these architectonic trombones. The Sony recording limiter did a wonderful job of taming the feedback, transforming squeals into smooth, controllable sine waves — a lovely instance of negative feedback trying to keep positive feedback under control. For an indoor variation the culvert and air mike were replaced by a lunchroom table and contact mikes, and the four inch Sony speaker was supplemented by a full-size PA. The resulting feedback resonated different pitches as the contact mikes slid across the vibrating table top.

For "Feetback" (1975) I embedded small microphones in the mouthpieces of woodwind and brass instruments, and wired each to a different loudspeaker. Four performers gathered in the center of the space, and then proceeded to walk outward toward the speakers. The score instructed:

"At each step along the path try to prevent your channel from feeding back by finding fingerings or spatial orientations of the instruments that cancel feedback. You may only take a step when no-one is feeding back. Continue moving in this fashion until you can no longer sustain any silence."

I was pleased with the Cagean twist in this piece: its sounds are unintentional, the result of trying to avoid feedback, rather

than articulate it; the players take on the role of a limiter trying to keep the gain under control.

The PA is replaced in "Q" (1975) by "speaker-instruments": mid-range loudspeaker horn drivers are affixed to the mouthpieces of a trombone and a saxophone. Each "microphone-instrument" is connected to a "speaker-instrument" via a simple synthesizer patch that adjusts the audio gain in response to key slaps on the microphone-instruments. Depending on the gain, the resulting feedback may take the form of a gentle, chime-like ringing, easily re-tuned by fingering or moving the instruments, or more aggressive, steady state feedback tones. As in "Feetback," much of the sound has a fleeting, spurious quality, and the players spend much of their time simply trying to suppress unwanted sounds.

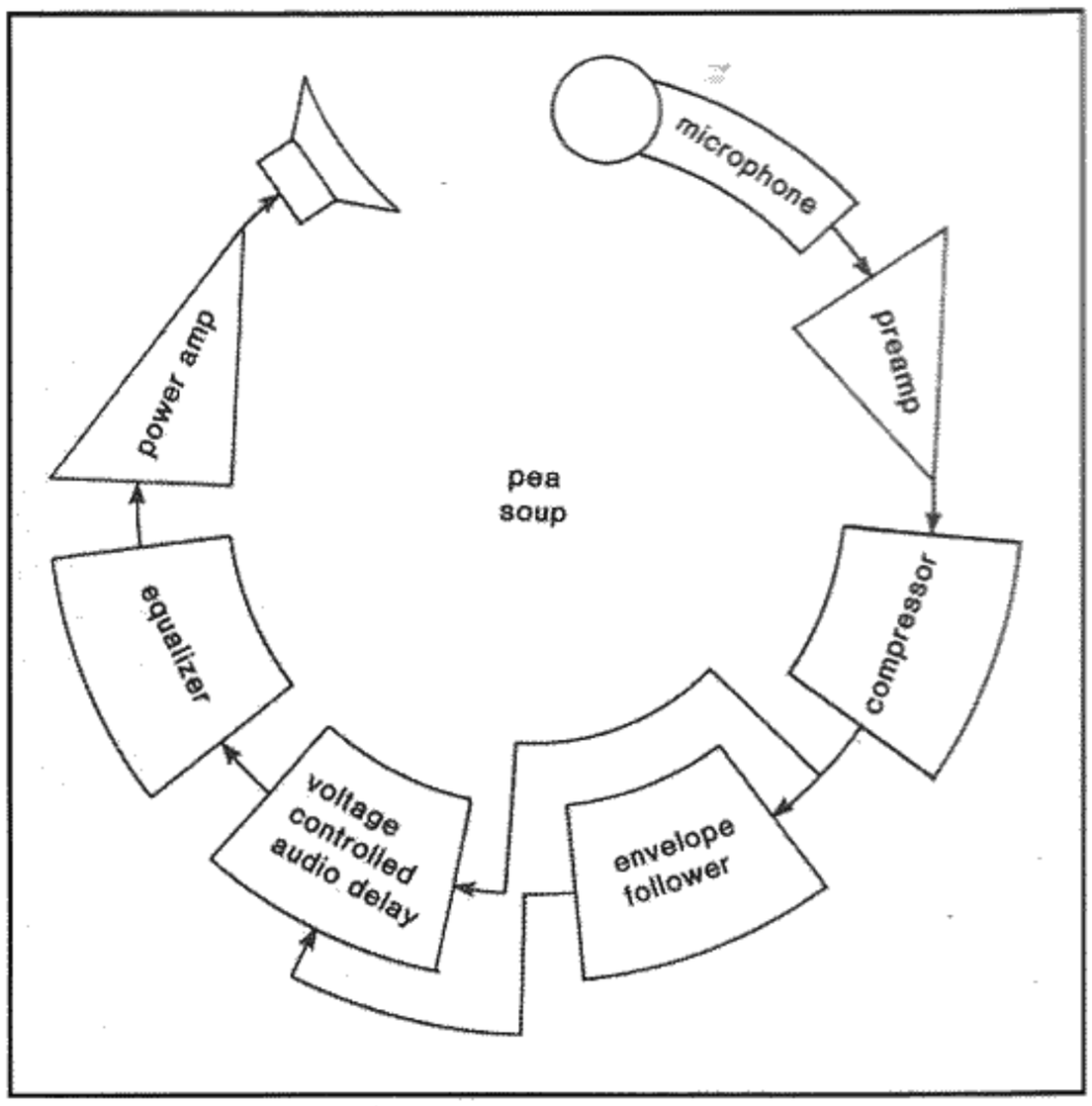
In "Pea Soup" (1974-76) my passion for unintentionality approached the sublime. With a limiter, an envelope follower and a Countryman phase shifter I assembled a simple electronic network that shifted the pitch of the feedback to a different resonant frequency of the performance space every time the feedback started to build — a clear example of a cybernetic self-stabilizing system. Feedback's typical steady shrill tone is replaced by patterns of pitches, and the specific pitches, shape and duration of this "architectural melody" are affected by the smallest of changes in the room. "Pea Soup" is equally suited to installation and concert realizations: the melodies can be manipulated by movement (dance or simply walking about), playing or singing, or even letting in a draft of cold air.

At the end of the 1970s I began building flexible architectural spaces with the intention of physically manipulating interior acoustics. I hung large sailcloth tents from the ceilings of galleries, concert stages and public spaces, and adjusted their shape via ropes attached to a performer's body, in a sort of reverse-marionette configuration ("Niche," performance version, 1978); by means of computer-controlled winches ("Niche," installation version, 1979); and using water ballast and pumps ("Water Works", 1980). Feedback, and later some feedback-like computer programs, revealed in sound the acoustical changes that accompanied the morphing of the tents — room-sized spaces that could be played as musical instruments.

In the 1980s and 1990s I was more concerned with social interaction, the flow of narrative, flawed self-limiting systems of human behaviour. But feedback (and its accessories) continued in my work as a principle, if not as a recognizable voice. With my first microcomputer I experimented with processing feedback by modulating filters at very fast rates, producing rich sidebands and unstable shearing textures ("Second State", 1981).[1] In the late 1980s one of the speaker-instruments from "Q" became the armature for my "trombone-propelled electronics."[2] Feedback is part of the basic vocabulary of this instrument: open microphones, picking up my voice or other instruments, ring through the trombone, and the feedback is manipulated by both the computer and the slide and mute ("Charlotte Aux Poires," 1997, and "Strange Heaven," 1998.)[3]

A couple of years ago, after 21 years without a performance, "Pea Soup" was reconstructed for a concert with the Kammerensemble Neue Musik Berlin. Although I worked from a circuit diagram kindly provided by Carl Countryman himself (who had long since ceased production of his phase shifters), I was not entirely satisfied with my attempt at cloning his mid-1970s analog circuitry. This year I stumbled upon a Max/MSP implementation of the circuit's central mathematical transform, and have been able to create a convincing software realisation of the original work, as well as extend it with some variations more easily implemented in the digital domain.

Recently I have begun working with electromagnetic feedback that is not, in itself, audible ("Mortal Coil", 2001.) Six telephone



Excerpt from score of "Pea Soup" (1974-76), Nicolas Collins

taps affixed to my fingertips feed back with six relay coils mounted close to guitar strings. The electromagnetic field causes the strings to resonate (the principle is similar to that of the "E-bow"). Moving the telephone coils in and out from the guitar produce Theremin-like glissandi of electromagnetic feedback, which are not heard directly but only as they force the strings into various modes of vibration. The result is a kind of updated "Tromba Marina," the medieval bowed string instrument on which one played natural overtones, trumpet-like, of a single open string.

The tautological elegance of feedback has a primal charm. Before they could walk, both my children delighted in waving the microphone near the speaker of their My First Sony, chortling along to the ensuing squeals (really, would I ever ask them to turn it down?). My first experiments with feedback didn't display much more sophistication. The kids have matured, moved on to piano, violin, drums, chorus and school band. I, on the other hand, have retained my infantile obsession, and nurtured it into love. My initial infatuation with the beauty of feedback's skin and its risqué behaviour grew richer with my appreciation of its inner workings. The balance of responsiveness and independence, of implacable science and seductive invitation, is rife with metaphorical implications. It's a natural phenomenon with social overtones. It's not just flash. It's philosophy.

NOTES

1. Nicolas Collins and Ron Kuivila, *Going Out With Slow Smoke* (Lovely Music, 1982).
2. The slide's position is interpreted, mouse-like, to control a digital signal processor that plays back through the speaker on the mouthpiece. Movement of the slide and mute gives an acoustic quality to the electronic sounds. See Nicolas Collins, "Low Brass: The Evolution of Trombone-Propelled Electronics," *Leonardo Music Journal* 1 (1991).
3. Nicolas Collins, *Sound Without Picture* (Periplum Records, 1999).

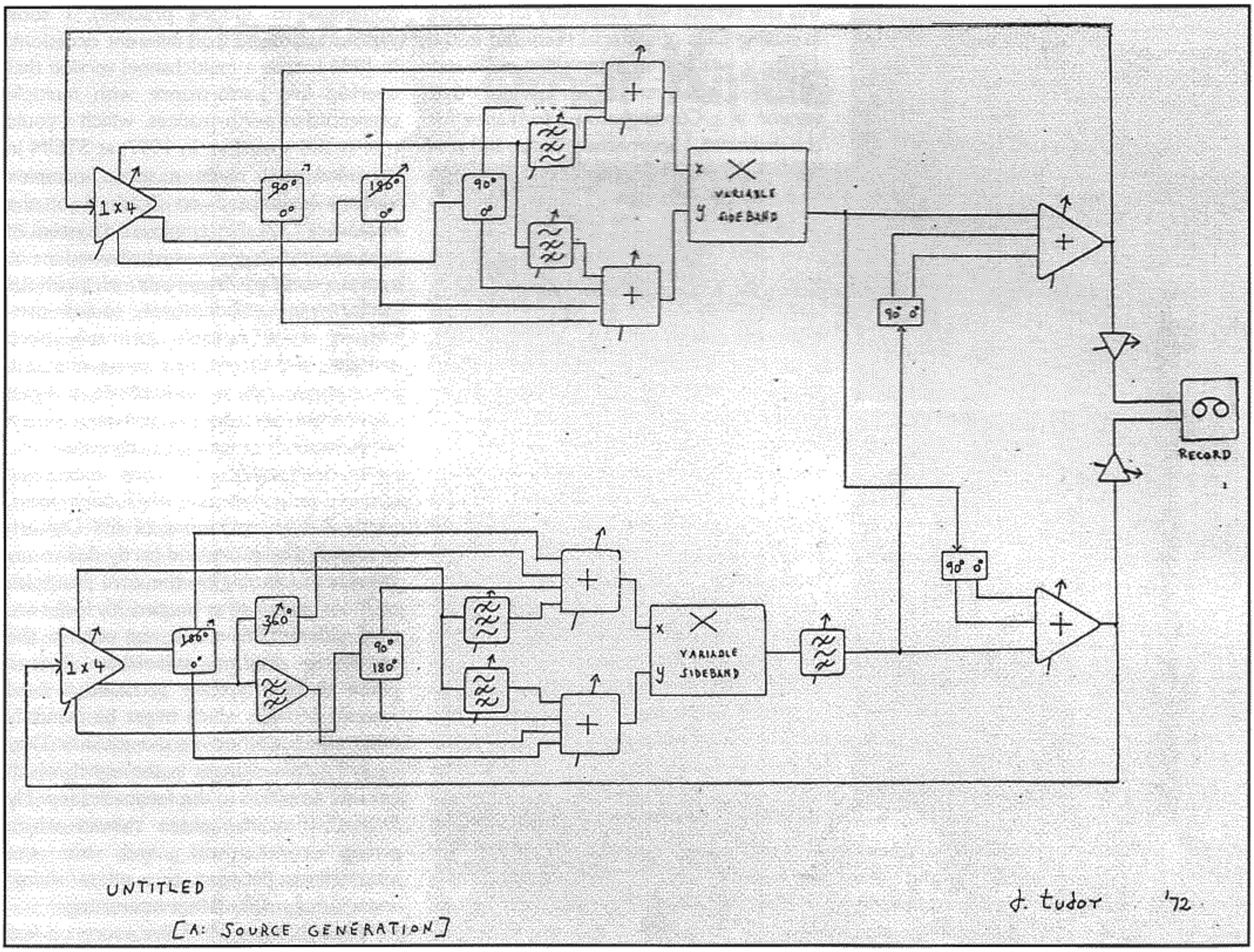
MATT ROGALSKY
David Tudor's Untitled: Feeding Forward

Tudor devices (photograph by Matt Rogalsky)

I SPENT THE MONTH OF JULY 1996 IN DAVID Tudor's basement, in Tomkins Cove, New York. He was upstairs in a fair amount of distress, having suffered a number of strokes which had left him blind, partially paralysed, almost unable to communicate verbally. He had a 24 hour nurse. It was hard to tell how much he was really in the world; occasionally he had moments of peace in which I felt I could connect with him, by reading a letter from a friend or talking to him about what I was doing, and my interest in his work. I had been introduced to him only two years before, and met with him occasionally for interviews or other research.

Most of the day and night I was downstairs, sorting, cataloguing and (where possible) testing hundreds of Tudor devices. I was pretty much overwhelmed by the sheer number and the obscurity of homemade devices, simultaneously incredibly charismatic and enigmatic. Most boxes had numerous connection points and knobs, switches, etc, but if any of these was labeled it was usually with some cryptic mnemonic code that it seemed only Tudor could interpret. It was very frustrating knowing that he was just upstairs but reduced to such a state that he couldn't assist in the work I was attempting.

What became apparent to me was the likelihood that any of the connection points on any of the boxes was both an input and an output, depending on the situation. It seems that Tudor's use of electronics did not depend on rules of 'proper' use but rather on intuition informed by deep background study in the subject; and there are many accounts of how he employed circuits 'backwards' or made use of the chaotic behaviour of failing components. Study of his devices (they are all accessible for use as part of the World Instrument Collection of Wesleyan University's Music Department, in Middletown, Connecticut) needs to proceed according to Tudor's own experimental working methods. It is



Part of David Tudor's score for "Untitled"

rarely the case that a single device forms the identity of a composition; it is rather a synergetic combination of devices which is required.

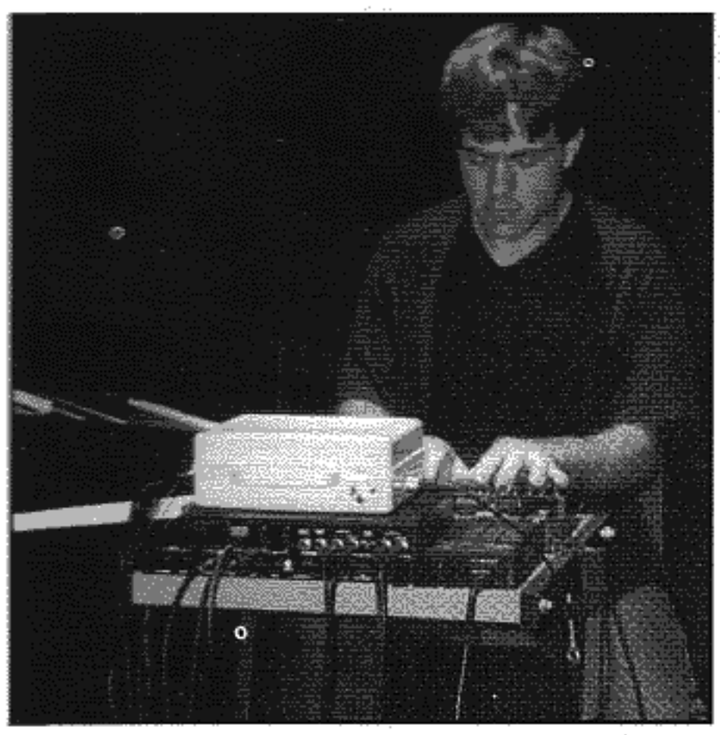
Possibly as early as 1969 Tudor was employing principles of electronic feedback to generate sound 'spontaneously,' *i.e.* without any external input. Photographs of his setup for *Rainforest* (the version for the Merce Cunningham dance of the same name) in 1971 show a number of boxes which upon examination turn out to be little amplifiers; Tudor made use of them as sound generation devices by connecting outputs back into inputs, allowing the noise in the system to blossom into controllable chaos: whoops, chirps and irregular rhythms. John D. S. Adams has written about the importance of Tudor's experiences at Expo '70 in Osaka, working with an elaborate sound modifier console designed by Gordon Mumma, for the development of these ideas.

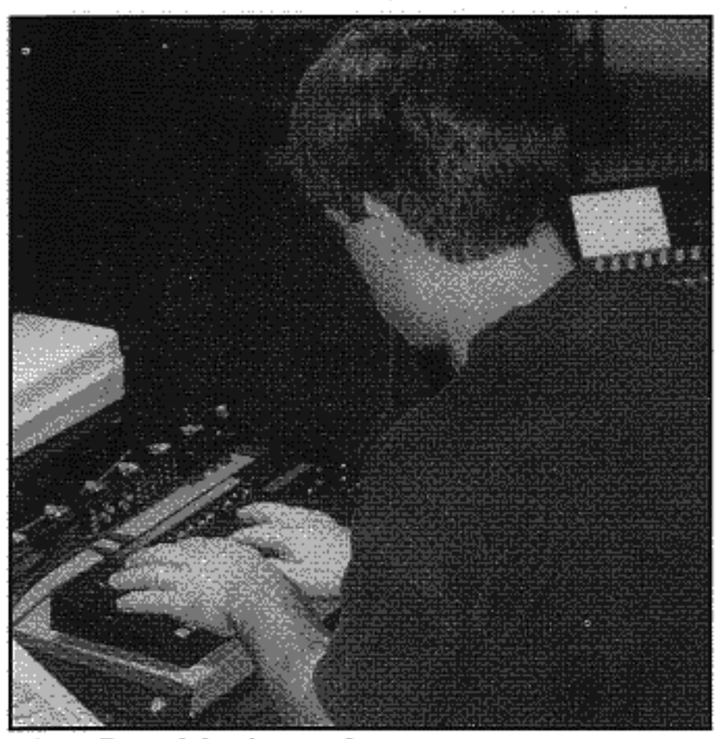
The feedback soundmaking approach grew into a major composition, *Untitled,* which Tudor first performed in the summer of 1972 on a European tour with John Cage (the duo's last major collaborative outing, and the first for which Tudor received composer billing). *Untitled* employed virtual chains of dozens of devices. For practical purposes, Tudor divided his system into 'Source Generation' and 'Performance Processing.' 'Source Generation' involved double chains of amplification, equalisation, fixed and variable phase shift circuits and a couple of Gordon Mumma-designed modulators, which produced feedback-generated sounds that Tudor recorded to tape. 'Performance Processing' took as input the prerecorded material from the 'Source Generation' phase. The practice of effectively multiplying the complexity of a system through reprocessing source material in this way (keeping the overall size of a system manageable, particularly for touring) is a feature of many Tudor pieces from around 1970 onwards.

Between May and July 1972, Tudor performed *Untitled* across Europe, with Cage declaiming his text *Mesostics Re: Merce Cunninghan* (hear Track 3 on the accompanying CD). It was premiered on 8 May 1972 at Radio Bremen, Germany, and the simultaneous performance of separate works mirrored the Cage/Cunningham method of collaboration (any synchronicities acceptable). Each performer had an independent multi-channel sound system and Cage used an array of microphones to move his vocalisations around the space, from loudspeaker to loudspeaker.

Tudor's published note on *Untitled* (in the liner notes for *Three Works for Live Electronics*, Lovely Music LCD1601), begins: "*Untitled* is a part of a series of works composed in the 1970s that were developed through experiments in generating electronic sound without the use of oscillators, tone generators, or recorded natural sound materials." Another version of this statement, written out longhand and found in the Tudor papers at the Getty Research Library in Los Angeles, uses significantly different wording: "*Untitled* is part of a never-ending series of discovered works in which the electronic components are found to be natural objects."

This suggests to me that Tudor thought of this series of feedback pieces as having always existed *in potentia*; somewhere there was energy waiting to be released and he was searching for means of letting it express itself. The electronic devices, though human-made, are following their 'natural' tendencies; the performer's role in creating the piece is to herd the electrons





Matt Rogalsky in performance

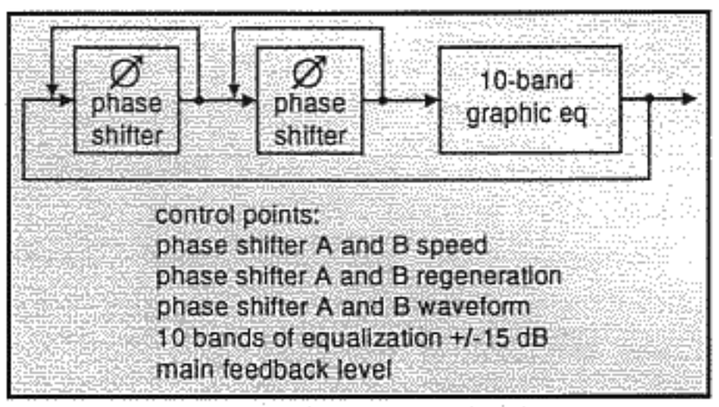
in one direction or another. The sounds are only semi-controllable and the instrument's barely manageable complexity is strategically designed to thicken the plot.

Tudor's interest in 'natural' processes was an integral part of his career as a composer/performer. In 1979 he stated: "It seems to me that the way I use the technical medium, it's just more of what's already there. I don't see, for instance, what's unnatural about a parabolic reflector. They exist in nature already, perhaps not in perfect forms, but neither am I after a perfect form" (1979 interview with Billy Klüver). It would perhaps be correct to say that it was Tudor, rather than Cage, who most sincerely practiced composing as 'imitating nature in her manner of operation' (one of Cage's professed goals).

IN 1975, TUDOR DEVELOPED *UNTITLED* INTO A commission for Merce Cunningham entitled *Toneburst* (the dance is entitled *Sounddance*). The live performance of the 1975 *Toneburst* differed from *Untitled* in that it used no prerecorded input; most or all sound was created by feedback loops. Interestingly, the piece went through a process of simplification when Cunningham brought the dance back into repertory in the early 1990s. Due to Tudor's deteriorating physical condition, this late version was essentially an exercise in mixing CDs of material recorded in the 1970s; it was still an astonishing sonic *tour de force*, however. After hearing that version in a Cunningham performance for the first time, I approached Tudor and told him what a stunning experience it had been for me; he laughed and said, 'Yes, it's shameless, isn't it?'

In 1996 I became interested in exploring some of Tudor's feedback loop principles, and finding new ways to implement them if possible. Searching for an affordable, programmable digital signal processor, I found one which Digitech had discontinued that seemed to offer the possibility of configuring internal feedback circuits, and also had unusually good MIDI control: up to 30 parameters could be altered remotely using a bank of MIDI faders. I found one second-hand in a New York City music shop, and bought it without knowing if I could in fact use it to model Tudor loops. Soon I had it up and running, figured out how to chain together virtual effects boxes — phase shifters and filters and gain stages, *à la Untitled* — and sure enough, when I routed the signal output back to the input, the box began to speak. It had its own 'digital' character but the range of sounds I was able to produce was impressive, and after a lot of experimentation I settled on four simple configurations which I programmed into its memory. Suddenly I had an extremely portable, unique (as far as I knew) new digital instrument deriving from a rich analog heritage. It also pleased me that I had been able to subvert the intended application of the device, turning it from a sound processor (great for 'ear candy') into a sound producer: a non-obvious use of the technology which I thought owed much to what I had been able to learn from Tudor's work.

The feedback patch which proved the most interesting combined two phase shifters with a ten-band graphic equaliser, as shown in the diagram below. Sometimes



small changes can cause enormous sonic shifts, and sometimes in surprising ways. For instance boosting high frequencies with the graphic equaliser can have the effect of bringing out low frequencies in the feedback loop.

Applying the instrument in improvisational performance (calling the piece *Tudor Loops* as a study of and hommage to Tudor's practice), I took various approaches on different occasions. In 1996 I made a multichannel version that overlaid live performance with multiple prerecorded performances, which I could mix in and spatialise. In 1997, at STEIM in Amsterdam, I made a more complex version (excerpted on Track 4 of the *Resonance* CD) that employed a system of light-sensitive triggers which allowed me to access sampled fragments of previous performances. Additional sound processors were available (primarily pitch shifters), and the multiple layers of sound were dynamically spatialised via a digital mixer controlled by my software, which moved sounds among four channels.

My feedback loops are extremely stripped-down version of Tudor's ideas, partly due to limitations of the Digitech processor's memory, and partly due to my interest in focusing on the core principles of Tudor's work circa *Untitled*. My loops are very different from his, not only in the technology used to realise them; Tudor's phase shifters typically provided a fixed amount of shift, which might be manually adjustable but otherwise did not vary. They caused subtle changes in the signal, which became amplified in the feedback loop. My Digitech box has phase shifters which sweep continuously, and it's the interference between two phase shifter speeds that makes things interesting.

Although since 1997 I've more or less completely migrated to a notebook computer as the heart of my performance setup, the Digitech box with its *Tudor Loops* patches still sounds unique and I recently used it as a sound source within a large installation of Tudor's 1973 group piece *Rainforest IV* in California. That to me was true feedback in action: my sounds, inspired by a 1972 Tudor composition, reintroduced as input for a realisation in 2001 of a Tudor piece from 1973.

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PHIL DURRANT

Other Kinds of Feedback

FEEDBACK, CONSIDERED IN MANY WAYS, HAS been central to my project with John Butcher. On stage, our music involves the live electronic treatment of his saxophone playing. From the beginning both John and I wanted to avoid the very linear, follow-my-leader approach to treating instruments electronically, to move away from the limitations of music where the saxophone sound comes first, the electronic treatment second. Instead, we wanted to create a dialogue, where we simultaneously co-author the eventual sound. This has meant that we have appreciated the full possibilities of feedback in our music - output returning to affect the input, where we are both responsible for output and input, and the eventual result is a synthesis of both, an interdependency.

It would seem likely that our sounds should always start at least with John's playing. However, to allow that would immediately plunge us into a kind of master/slave relationship, with my treatment playing 'second fiddle' (so to speak!) to his saxophone. To avoid this, we set up parameters whereby my treatments have internal feedback which can be transformed and manipulated by an incoming sound. We do not, therefore, start with a blank page. In a sense, there is never a true 'beginning'.

The communication John and I achieve on stage is a result of a long standing relationship, a relationship during the length of which we both have fed back to each other as musicians and friends. I met John in 1983 at the West Square Improvisation Workshop led by Phil Wachsmann. I was already playing with John Russell (guitar) in a trio with Mark Pickworth (saxophone). When Mark decided not to continue with the group, John Butcher took over. John Butcher and John Russell showed a commitment to our project, so that we had rehearsals together every week, where we could constantly feed back to each other. It is fair to say that the Butcher/Durrant/Russell trio became one of the most important and influential groups on the scene. It would be nice to think that we have fed into international improvisatory music.

These were important times, with everyone interested in exploration. It is possible that the political climes were a source of feedback, and our musical work fed back into the culture of the day. To continue the metaphor, we took as input the individualism of the Thatcher era, transforming it into an impulse to engage in group music, so that our trio was never about three individuals expressing themselves, but a mutual project.

Phil Durrant (photograph by Dennis Austin)

There are other kinds of feedback too. The acoustics of the room we play in affects the kind of material we can use. A live room (a church, for example) creates more possibilities for acoustic feedback. Recently, John and I played in an old church transformed into a music venue in the centre of Liege, Belgium. Not only did the acoustics provide positive feedback, but the sensitivity of the organisers cannot be underestimated in creating possibilities for our musical dialogue. The stage was positioned in the centre of the space, so that the audience were particularly aware of the mutual authoring of the sounds. They could see when John played and hear when music was being made when John was silent.

Studio recording provides a contrast to live performance. We have discovered a lot of material during live sets. At another gig, also in Belgium, this time Brussels, we found that material presented itself to us because of the acoustics of the room.

Much electronic music or electronic treatment results in a slow musical development, a continuous flattened soundscape. We have always wanted to retain the possibility of sharp changes in mood and material. We consider there to be a flexibility and dynamism to our music. Both John and I can change the mood, so that constant feedback is an important part of the sound we create.

DAVID LEE MYERS
A Personal Journey Through the Ourobouros

David Lee Myers

UNDOUBTEDLY SINCE THE EARLY TWENTIETH century and the advent of amplified sound, feedback has been the nemesis of sound systems and individuals charged with operating them. After many decades of being cursed and sent to the devil, it is perhaps not surprising that the devil should now have his due and sound-workers finally come to praise the accursed — or could it be that the child was simply misunderstood all along?

It can be safely assumed that everyone is familiar with the common phenomenon of feedback such as produced inadvertently through poorly configured microphone /speaker situations in concert performances: the sound coming from the amplification system finds its way back into the microphones and produces an uncomfortable squealing sound. The component elements are electronic and acoustic, the latter involving air movement and vibration of physical objects. This also holds true for the famed feedback of Jimi Hendrix and so many electric guitarists since his time — a speaker moving air and shaking the strings and guitar body, magnetic pickups microphonically taking it all in and sending the signal back to the amplifier in an endless cycle. The phenomenon is perfectly represented by the image of the 'Ourobouros', a circular symbol of antiquity, portraying a snake swallowing its own tail. This electroacoustic feedback is likely to have been employed by musicians from the time amplification was invented, but it entered the spotlight in the 1960's probably due to that decade's character of rebellion and dissent; the unruly child was taken under its wing.

SINCE 1987 I HAVE PRODUCED MUSIC derived exclusively through feedback principles, but my approach differs from the described scenario in that the sounds I use, and the feedback I produce, omit the component of acoustic space. It has always been the unseen forces behind observable phenomena which have fascinated me most. My attention is immediately drawn to the circular paths observed in schematic electronic diagrams. Electronic feedback is quite a curious animal, something distinct from electroacoustic feedback. It can operate — feed back — eternally, but make no sound; vibrate no air; reach no ears. It is this silent marching of electrons, antlike, about some elaborate roadway perhaps only known to themselves which is so curious.

It should be noted that the simplest oscillator is merely a rudimentary amplifier which is fed its own output in this fashion, so at base the phenomenon is not unique; it is a basic premise of electronic design. But the simple oscillator is something akin to an oval running track — very plain-vanilla, obvious and predictable. What if the course runs through tunnels, under a river, down dark alleyways? These are the electronic paths which begin really to arouse my enthusiasm.

The introduction of the musical 'Effects Device' was for me the real opening of an interest in sound and music. The initial impression an early Echoplex tape-delay made on me (*c.* 1966) still reverberates, as it were — I put down my guitar and focused on this thing itself; who needed a guitar now? A sound goes in one end and comes out the other, somehow transformed into a modified clone of itself; partially the same, but evolved. And it was — and remains — significant to me that this transformation is a manipulation of the sound's time-path. Most musical effects boxes — and all of those which interest me most — are based on manipulations of time, that strange entity which even the most advanced scientific analyses have yet to explain convincingly. Since childhood this inexplicable thing called time has puzzled and excited me, and in the Effects Device the question of time comes forth with a satisfying aesthetic pleasure. Further, the concepts of time manipulation and feedback come together in the ancient Ourobouros symbol which was intended to speak of several things at once: self-referral (consciousness), recurrence, and eternity. To me, feedback is far more than a public address system in misalignment; it is a core principle of universal importance.

Midway in my musical/technological explorations I acquired four of the best moderately priced delay units available at the time — the Digitech 7.6 — in an attempt to construct the ultimate loop-music setup, such as might be employed by Robert Fripp or Terry Riley before him. While designing the mixer, I realized that for the most open-ended layout, I could create a matrix of 'effects sends' whereby any delay's output could be routed to any other delay's input, including its own. The results astounded me, and in 1987 'Feedback Music' was born; the complex electron paths which could be created with this setup allowed for the production of a very wide variety of sounds within and between the delay units.

Simply put, in such a set-up the delays never receive signals from the 'outside world', and instead feed on a diet of their own product; a whole new function of these devices appears, bearing little relation to their intended purposes.

The way I envision it, the devices are

given the opportunity to 'sing their own songs' — the resulting sounds represent nothing other than the free circulation of electrons within. In effect, these sounds come from nothing, and more than one observer has proclaimed them to arise 'from the ether'.

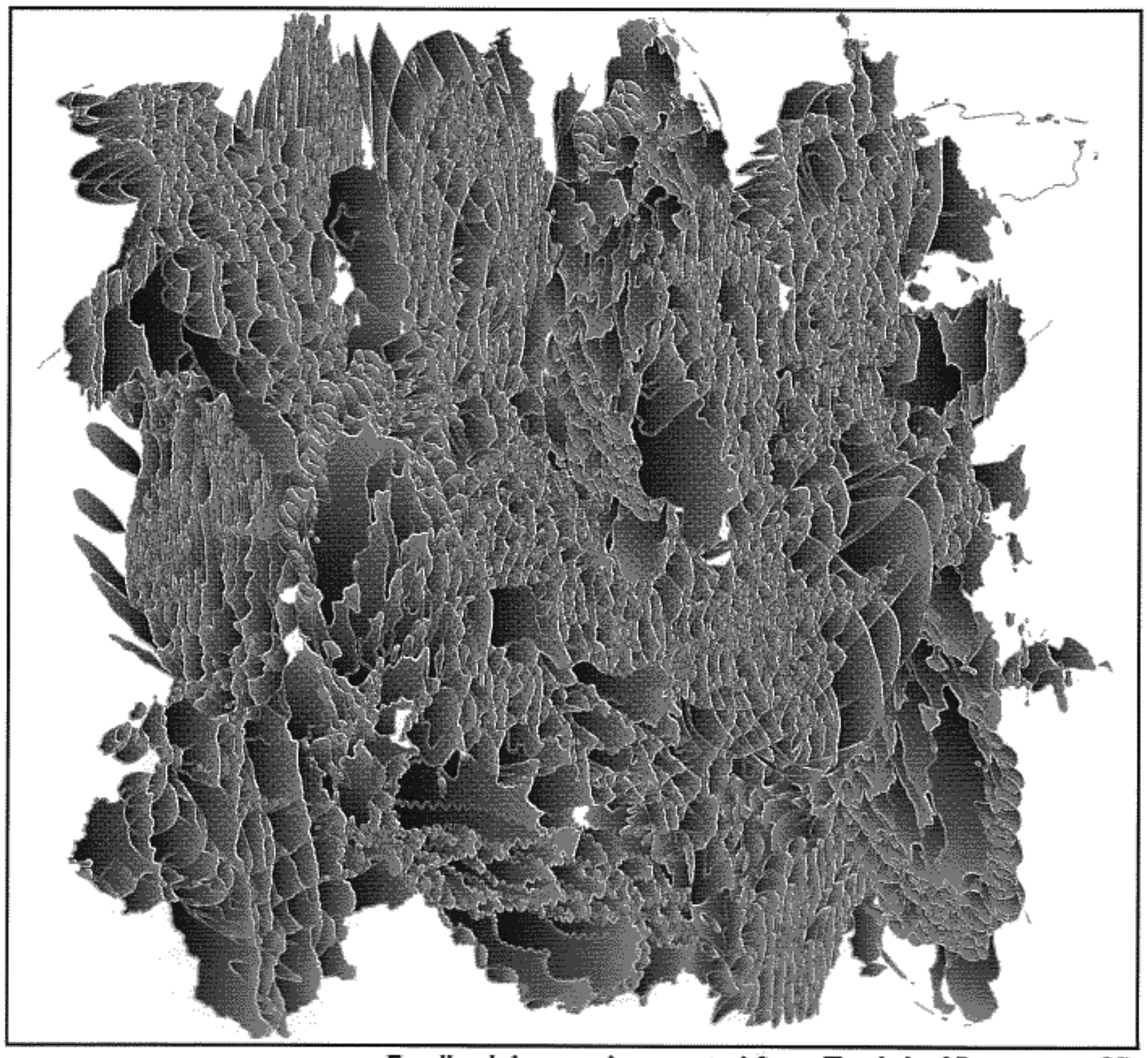
My most recent systems make use of sound processors whose capabilities dwarf those old Digitech delays, creating ever more entangled electron paths and opportunities to catch moments of feedback tones, and spit them back out in more mangled forms. However, the process is basically the same, and I still attempt to let the devices speak with their own hidden voices. Unlike electroacoustic feedback, I have found over many years that this purely electronic feedback exhibits no limits in terms of tonal coloration and dynamic pattern. In some instances what seem to be vocal sounds, or imitations of conventional instruments, appear; the next moment, a shortwave radio broadcast or atonal orchestral wash. What has perhaps maintained my interest all this time is the fact that the sounds generated by my feedback systems are almost totally unpredictable; I am surprised each and every time I sit down to work with them. This does cut both ways — I admit to being unable to exercise complete control of what tones arise, and it is sometimes a challenge to wrestle these into a shape and form which I find aesthetically satisfying. Every performance (including performances only for a recording device) is a duet improvisation wherein I am paired with a truly crazed player. It can be a workout, and worse, an embarrassment: a public performance may be fully gratifying, or something less. However, I pride myself on the fact that no concertgoer will ever hear the same presentation twice — it is simply not possible.

Music created entirely through feedback may be viewed in two ways. In one sense, it might be said that it is a case of simple autocannibalism. But I prefer a more positive stance: no living organism can exist without feedback, without a constant monitoring of itself, and I seriously consider the flow of electrons described above as a living thing. The feedback principle may in fact represent one of man's greater possibilities; the words commonly attributed to Socrates, 'know thyself', imply several levels of meaning. I perceive, but I also have the possibility of perceiving that I perceive--and this may create an entirely new phenomenon. The same seems to hold true in the world of sound.

It might be said that the perceptual worlds we hold most dear are those of sound and of sight. In the larger scheme of things, the spectrum of visible wavelengths in fact differs very little from the analogous spectrum of audible sounds. From the perspective of the entire electromagnetic spectrum, which encompasses the vast majority of phenomena observable by human beings — and reaches far beyond it — our audible and visible bandwidths are nearly indistinguishable. This perception has led me to explore the interrelation of these two seemingly disparate worlds, and since 1991 I have striven to discover ways to translate the sounds produced by my Feedback Music into a visual form. In my initial trials an important tool in this exploration was the oscilloscope. The oscilloscope represents visually a sound's amplitude variation plotted against its time variation; and also represents phase variations between left and right stereo channels (known as the 'Lissajou' pattern).

The complex phase relationships naturally arising between stereo signals in the Feedback Music made this approach all the more appealing, and early on I produced a crude video project which presented the meeting of these audio and visual phenomena.

Late in 2000, as I began to assemble a new series of Feedback Music hardware and to discover new sounds, record, and process them, it was not long before I again felt the need to translate these sounds into their visual counterparts. Using the more modern software versions of the oscilloscope and other sound-to-visualization techniques, I began to capture 'time slices' of my sounds and process them through digital means. The resulting images, which are output as archival dyejet prints, I term 'Feedback Impressions'. Even more recently, I have begun to utilize interactive sound/video software in music performances in the effort to close the gap between the aural and the visual.



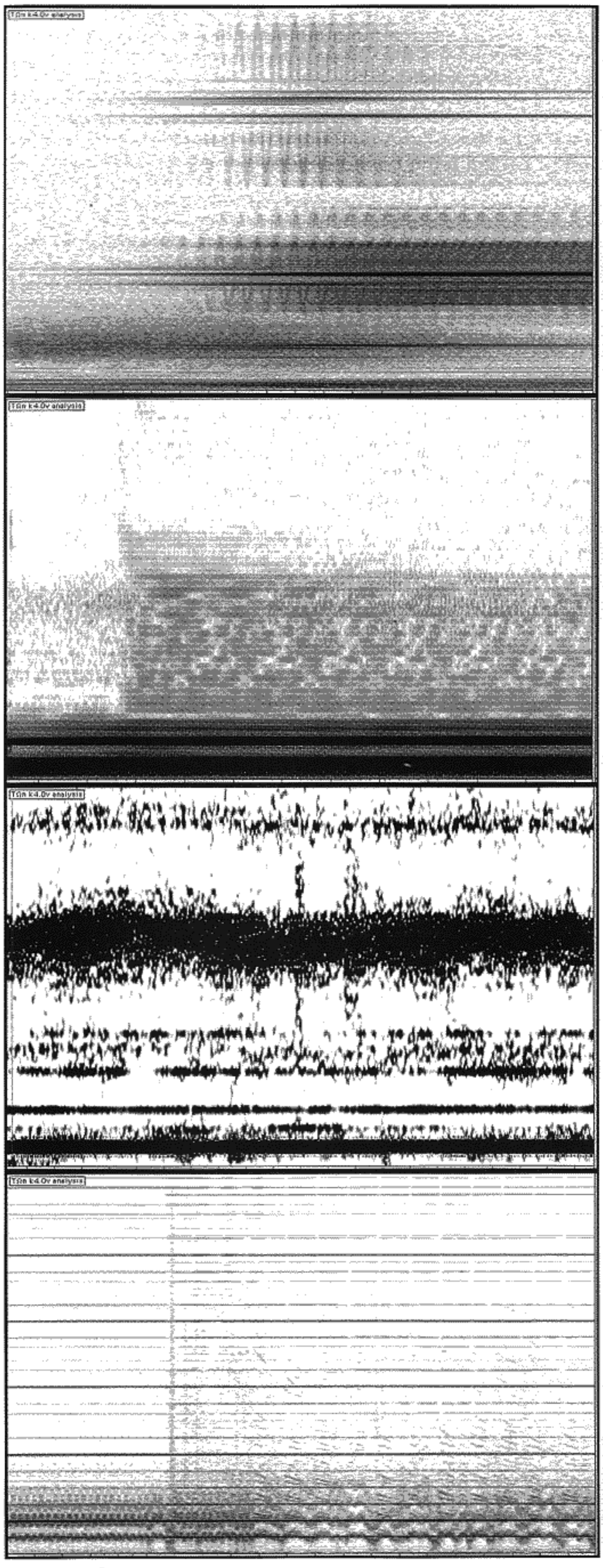
Feedback impression created from Track 1 of Resonance CD

Both my sound and visual works are the result of capture, selection, processing and combination; essentially, I do not *make* sounds or *draw* pictures, but allow latent or unseen forces and processes to present themselves via simple technologies. I select the methods, set the stage, and as the phenomena emerge I introduce my own aesthetic judgements to the mix. Therefore the sounds and visuals which are presented are neither completely random science nor the gesture of an artist's hand, but something between the two; and I believe this to be the most effective approach toward evoking meaningful impressions of unseen worlds.

The Ourobouros is the symbol of a major driving force which animates the energies in these worlds, and the self-reflexive feedback principle is an inexhaustible source of new movement and fresh animations of these energies. Let the unruly child play!

KNUT AUFERMANN

Feedback is Everywhere



ABOUT 12 YEARS AGO I WAS TAKING PART IN A WORK PLACEMENT AT a governmental Institute for Chemical Analysis in Hagen, Germany. One day my supervisor did not have much work to do so he showed me a book he found called 'Chemical Show Experiments'. After a quick flick through it we decided to try the 'Chemical Clock'. Four different substances are mixed together in a big glass cylinder and then stirred constantly with a motor. Nothing seemed to happen at first but after about one minute all of the clear liquid instantly turned pitch black. Then clear again and then black again with frightening precision. Every few seconds this chemical clock would change its colour and this process went on for more than an hour. This reaction was also called a 'Chemical Heart' and it felt quite alive to me.

Going back to school I questioned my chemistry teacher about this experience. Having learned that the laws of thermodynamics say that every reaction strives towards an equilibrium this chemical clock did not make sense. My teacher told me that it was very close to its equilibrium, just with tiny disturbances before it settled down completely, and that the change of colour fell by chance into this near-equilibrium area.

A few years later I read the book *Order Out Of Chaos* by chemistry Nobel Prize winner Ilya Prigogine and Isabelle Stengers, and discovered that the chemical clock was called the Belousov-Zhabotinsky reaction and that my school teacher was wrong. Chemical reactions can be stable or oscillate far away from equilibrium, in fact most of the functions in cell biology rely on this behaviour.

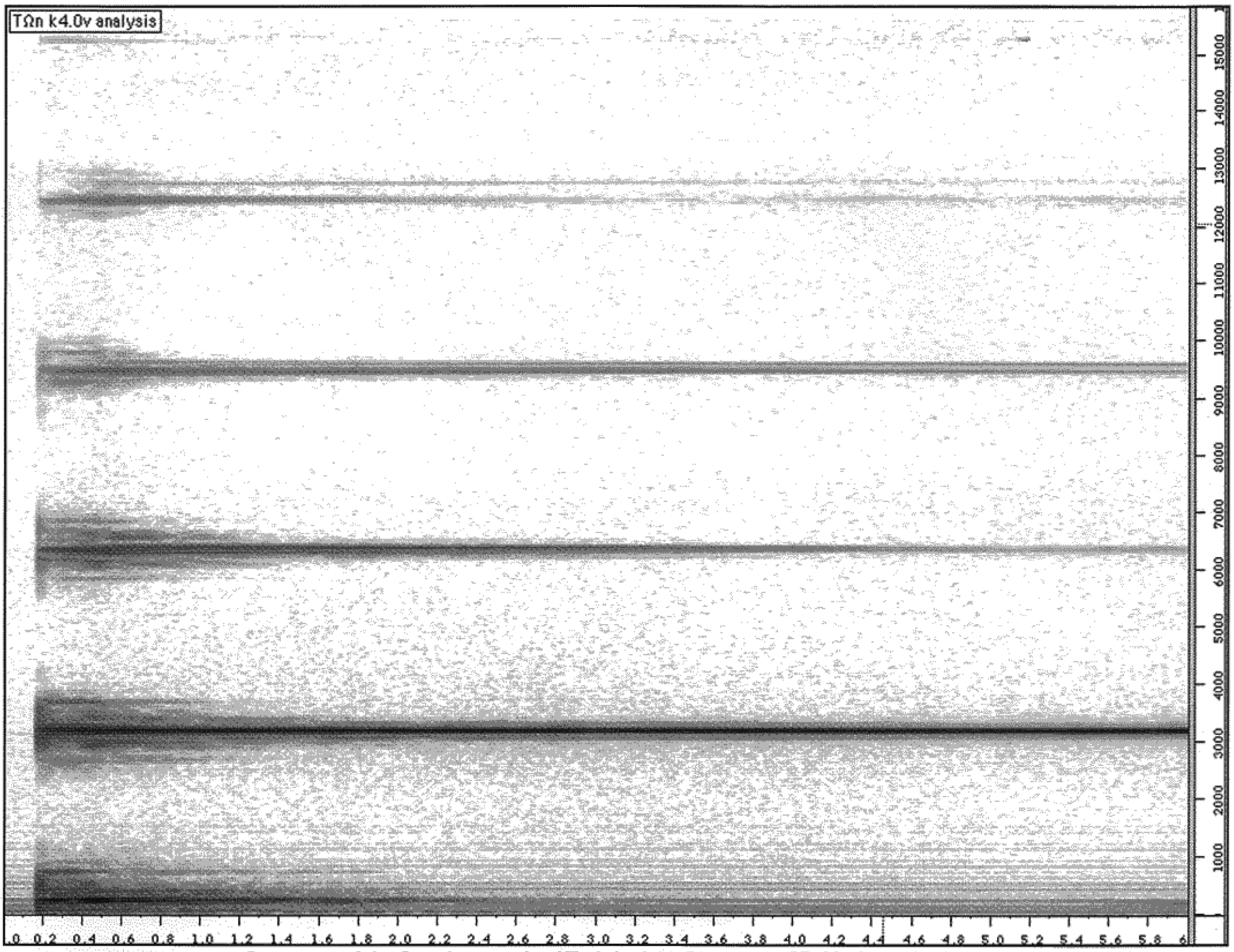
Several years after that I found myself trying to learn how to operate a NEVE VR mixing console with flying faders. Impressed by the amount of buttons to press I lost track of my actions and at a flick of a switch created an internal electronic feedback loop. All meters showed me their red LED's and the speakers created a spectrally rich, wonderfully loud roar. An alerted staff member opened the sound proof door and asked if I was okay.

NOWADAYS I DELIBERATELY USE INTERNAL FEEDBACK BETWEEN electronic equipment to produce sounds.

At a recent visit to a library I stumbled across the book by Prigogine and Stengers again and reread the chapter on the Chemical Clock. This time the underlying reaction mechanism (called autocatalysis: X supports the production of X in the simplest case) became clear: the existence of a feedback loop throws the system into an oscillating behaviour far away from its equilibrium. Now this statement is equally valid for my sound set-up. The same concept lies behind a show experiment of inorganic chemistry and the sound which emerges from wrongly connected effects units. So why is this whole thing so interesting?

For me it is the behaviour of the system. Both the Chemical Clock and feedback sounds are mesmerising. And it gets even more interesting when you can play with it. The complex quality of the (un)predictability of my feedback sound set-up is a constant challenge. For a closer description of these qualities I like to employ the following analogy: What would my feedback instrumentarium behave like if it were a piano?

- Pressing a key would make a quiet or a huge or no sound.
- If there is no sound, pressing the key harder could eventually lead to a sudden, very loud sound that rattles the piano frame.
- Sounds could appear immediately or swell up over time and would generally stay until you release the key.



Sonogram of the first six seconds of Tack 2 of the Resonance CD. Horizontal axis: time. Vertical axis: frequency.

- Keys on the left side would generally produce lower pitches than keys on the right side of the keyboard. That does not means that this order could not be reversed on some keys.

- Pressing more keys to create chords would most of the time lead to different new individual pitches, but just touching other keys with your fingertips could unleash complex chords.

- Using the foot pedals would generally alter everything that is played, including pitches, volume and timbre (and could easily lead to another rattling of the frame).

My fascination when performing live is the limited but nevertheless existent predictability that forces the player to use intuition instead of technical skill, anticipation instead of predetermination — all in the knowledge that tiny changes can have huge effects and that you have to accept what you get.

IN MY SEARCH FOR MORE RELATIONSHIPS BETWEEN FEEDBACK sound and science I came across a computer program that creates sonograms. These are displays of the frequency range over time (with the amplitude of the frequency shown by the shading) of a sound file that is analysed using the mathematical method of Fast Fourier Transformation (FFT).

The sonograms shown here were taken from a live track (an excerpt of which you can find on Track 2 of the accompanying CD). They show stable and unstable oscillations, emerging patterns of different complexity (and beauty), chaos and the existence of continuous and discrete, quantised spectra of frequencies. Given the correlation between energy and frequency (E=hv) stated by Einstein and De Broglie one could compare these sonograms with findings from quantum physics. Some tones produced through feedback show quantised energy levels throughout the audible range. Perhaps these analogies are a bit far fetched, but the dilution of the strict separation between actor and spectator during experiments as proclaimed by quantum physics — and thus the possibility of a constant feedback loop between experiment and experimentalist — is a lot like the relationship between feedback players and their instruments.

In general this necessity of a feedback loop applies to all forms of communication. It is the case for communication between players in musical improvisation just as it is between the billions of molecules which change colour at the same time in the Chemical Clock. Feedback processes are everywhere.

I would like to close the circle with another story from the chemistry world told by one of my former professors. As a student he found himself out of money and out of fuel for his car. Applying his chemical knowledge he went to his lab, stole a bottle of pure octanol (with a possible octane count of 100) and filled his car's fuel tank. It was only after he had managed to drive all the way to his house that he realised the engine would not stop after he took out the key. Without being able to stop the fuel flowing he had to leave his car running in front of his house until the tank was empty. Surely the motor was engaged in some sort of feedback reaction.

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MICHAEL PRIME
Explorations in Bioelectronics

Michael Prime

"When considering the spontaneous structures which arise in truly improvised music, questions of the immanence or transcendence of mind in body become irrelevant. Awareness comes that the mind of the player is to be found everywhere in an information carrying circuit, such as:

"Differences in vibration of instrument; differences in vibration of eardrum; differences in central nervous system; differences in muscular action; differences in tool of excitation; differences in vibration of instrument...

"Each of these circuits interlinks with many others to form larger systems of mind. This concept of mind is equally applicable to other complex information-carrying circuits, such as an oak wood or a coral reef."

[1]

I WROTE THE ABOVE IN 1987, IN AN ATTEMPT TO DESCRIBE THE SENSE OF 'group consciousness' I was experiencing in live electronic improvisations with the group Morphogenesis. By abandoning preconceived structures and surrendering one's playing to the unfolding moment of the music, we sometimes found that musical events took place which were more complex and surprising than any of us could have conceived of individually.

Since that time, I have conducted an ongoing exploration of musical interactions with 'larger systems of mind', by improvising with autonomous and semi-autonomous elements from the natural world. In 1992, I tried to sum up my explorations in a statement:

"Towards a New Ecology of Sound

"In my music, I try to bring together sounds from a variety of environmental sources into a performance space, particularly sounds which ordinarily would not be audible. I also use live electronic processing to give these sounds new characters, and to enable them to interact in new ways. For instance, traffic sound may be filtered so that it resembles the sound of surf, while actual sea sounds may be transformed to conjure up images of an interstellar dust storm. Electronic processing allows microscopic and macroscopic sounds to interact on an equal basis.

"I am especially interested in organic sound sources, such as plants, fungi and the human nervous system. All of these have participated in my music, thanks to a machine known as a bio-activity translator. This is able to translate the fluctuating voltage potentials produced by all living things into sound. I have also invented a mechanical instrument which can sound remarkably organic, in the form of my 'water-machine'. A system of pumps and valves is used to control the production of bubbles in a small water-filled chamber, which is then amplified and processed electronically. The resulting sounds can resemble those of pond life at one end of the scale, or of the sea at the other.

"Short-wave signals interpenetrate our bodies at all times, and provide a vast musical resource. The signals may originate from cosmic sources, such as the sun, pulsars and quasars, or from

human sources. However, they are all modified and intermodulated by the earth's own nervous system, the magnetic particles that surround the planet like the layers of the onion. These layers expand and contract under the influence of weather systems, the sunspot cycle, the cycle of night and day and other cosmic forces, to produce complex patterns of manipulation.

"Many of the characteristic effects of electronic music (such as ring-modulation, filtering, phase-shifting and electronic drone-textures) were first heard in the interaction of early radio broadcasts with the earth's magnetic layers. Perhaps Gaia was the first composer of electronic music.

"Eventually, I hope to use all available technical means to access further environmental sound sources. At a given location, plants, fungi, animals and humans could be electrically and acoustically monitored, wind and water could be used to drive sound sculptures, and receivers could be tuned to radio, gamma and cosmic rays. This would provide an infinity of possibilities for live musical interactions in a new ecology of sound."

[2]

I AM AN ECOLOGIST BY TRAINING, AND MY STUDY OF THE INTERACTIONS of humans with natural systems has provided a springboard for my work in sound. The self-balancing nature of ecosystems and the complexity of mankind's relationship to the natural world seem directly relevant to me. For example, the same human activity (such as felling woodland and the prevention of regeneration by grazing) can result in either a decrease (in the case of tropical rainforest) or an increase (in the case of chalk downland in Britain) in biodiversity, depending on how and where the activity is carried out, and how long it has to develop. I have always preferred to work with sounds that have some independent life of their own, and which I cannot completely determine. These do not have to be sounds from nature; sound sources such as my 'Water Machine' or short-wave sounds, feedback systems or computer software incorporating random elements all have a complex, cybernetic life of their own. I can adjust their outer parameters and interactions, but they will always have a surprising quality that I will have to react to. In this sense, my music is based on the creation of 'ecosystems' of different sound elements.

"Both genetic change and the process called learning (including the somatic changes induced by habit and environment) are stochastic processes. In each case there is, I believe, a stream of events that is random in certain aspects and in each case there is a nonrandom selection process which causes certain of the random components to 'survive' longer than others. Without the random, there can be no new thing.

"Creative thought must always contain a random component. The exploratory processes- the endless trial and error of mental progress- can achieve the new only by embarking upon pathways randomly presented, some of which when tried are somehow selected for something like survival" (Gregory Bateson, *Mind And Nature*).

Like Bateson, I believe that the concept of natural selection can be applied equally to the processes of the human mind and the survival of organisms in nature. Randomly induced ideas or sensory impressions are tested against the memory bank of similar ideas and impressions, just as new mutations are tested against existing organisms in the natural world. The comparison of newly perceived patterns with known ones may eventually allow a metapattern to be deduced.

A further aspect of 'sound ecology' centres on the interface of mind and landscape, and the production of site-specific works. This interaction may take place on many levels, and extends far beyond the mere use of location recordings. Particular regions of our planet often seem to possess *genii loci*, which find expression in the interactions of geology, topography and climate with the plants, animals and human civilisation found there. These influences are active on any sound artist, but the 'sound-ecologist' actively engages in an investigation of these metapatterns.

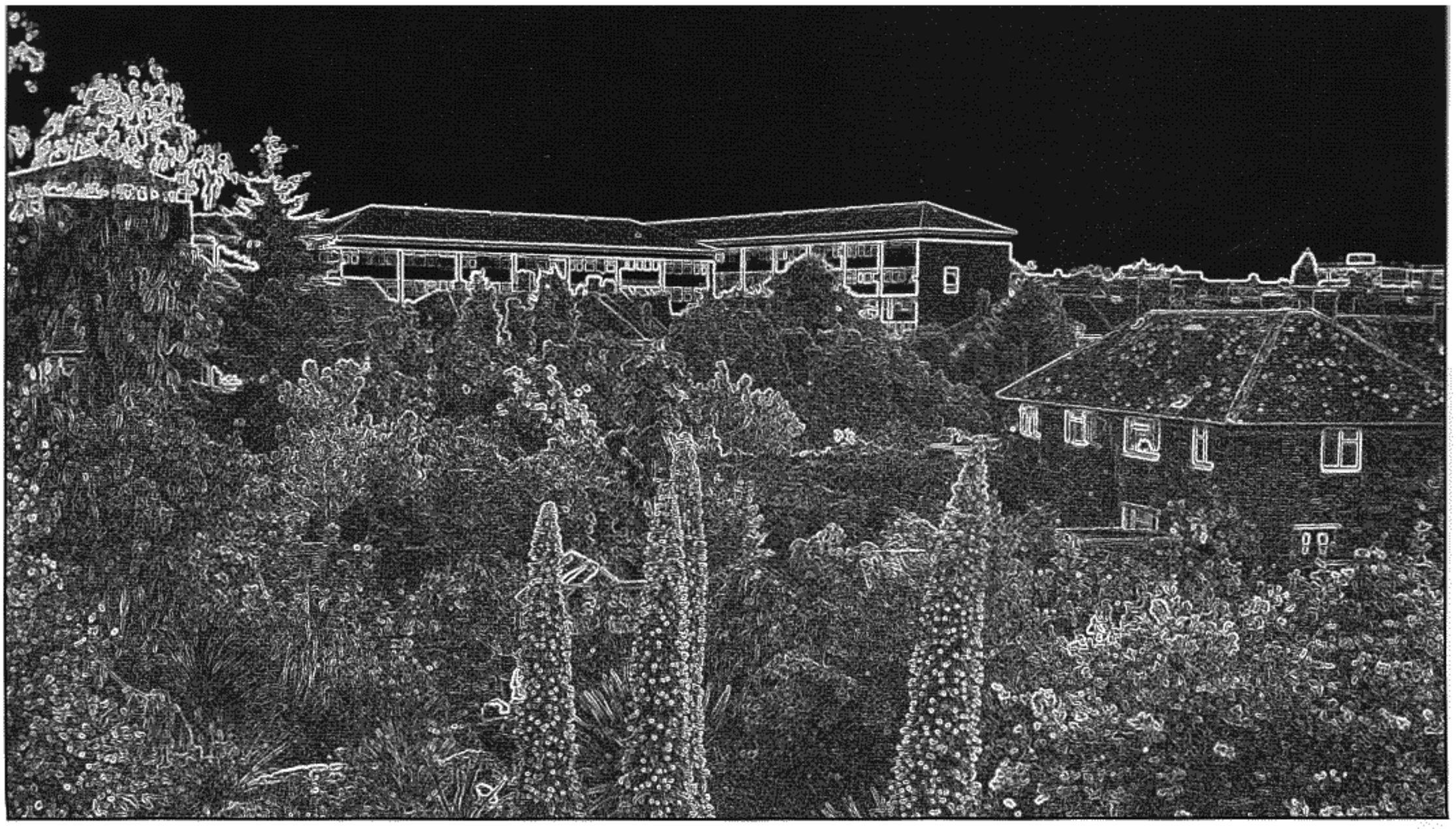
The ability to amplify bioelectrical signals from living plants and animals allows the composer to interact with natural processes on many new levels. The Bio-activity Translator directly measures the fluctuating voltage potentials produced by living organisms, which constantly vary according to their mental or physical state. Voltage potential is a much more sensitive indicator of these states than skin resistance, which is what is measured by 'lie-detectors'. Dr. Harold S. Burr, of Yale University, made extensive studies of these potentials, which he called 'L-fields,' in the 1930s and 1940s. He had several local trees connected to voltage meters for a period of years, and discovered that their voltage potentials varied not only with periods of light and dark, but also with the cycles of the moon, magnetic storms and sunspots. The fields of humans varied not just with these natural rhythms, but also according to mental state, health, presence of cancer etc. He finally postulated that these fields were not just a pattern produced by living organisms, but were also the morphogenetic blueprint that controlled their development.

Burr's work provided the inspiration for my CD *L-Fields*, in which I recorded bioelectrical signals from three different plants in situ, together with the background acoustic. These sounds were used in raw, manipulated and intermodulated form in the compositions, but always retaining their natural rhythms. In the field, choices have to be made about the parameters the translator is set to, which will affect the frequency range and other aspects of the sound. Nevertheless, the rhythms which emerge are very much a reflection of the life processes of the plant. A dead plant, or a fruit or vegetable which has been picked, produces only a static tone.

The pieces on *L-Fields* are 'sound portraits' of the life of each plant, in which an hour or more of bioelectrical recordings of a plant and its acoustic background are condensed into a 15 or 20 minute piece. Nevertheless, there are sections in each piece in which 'real-time' events take place. For instance, the harsh outbursts at the beginning of 'God's Own Dibber' were produced by the plant when it was suddenly struck by a beam of sunlight. The more continous sounds which follow were produced in the cloudy conditions which otherwise prevailed on that day.

I chose to use hallucinogenic plants as the subject of *L-Fields* because of their complex relationship with the development of human cultures. This interaction may extend back into prehistory, when ingestion of hallucinogenic plants may have led to the first 'religious' ideas in early humans. The shamanic themes and visual style (often involving the interpenetration of human and animal forms) of Cro-magnon cave paintings certainly suggest this. In our own age, composers and musicians in almost every field have created music influenced by their ingestion of such plants. Would any similarities be apparent in the bioelectrical sounds of these plants and their human cultural artifacts? Amazingly, it seems to me that the sounds of the Cannabis plant do have a 'trance-like' quality (with occasional violent outbursts!), while the sounds of *Amanita muscaria* (the Fly Agaric mushroom) seem to contain some of the rhythms heard in the drumming of Siberian Shamans.

The extreme sensitivity of plants to their environment presents particular problems for live performance. Being moved to the performance venue often causes the natural rhythms of the plant to be submerged by its drastic reaction to its new, and apparently unfavourable environment. However, in 1999, I was able to give an



outdoor performance in Madrid (for CIEM), in which I wired up a 1000 year old olive tree in situ. It was a complete contrast to the potted plants I usually have to use in performance. It seemed totally unaffected by the human activity around it - even touching it (which produces a strong reaction in a small plant) had no apparent effect. Living on such an extended time scale, it was as if it took no more notice of humans than it did of the small flies buzzing around it.

The dictates of performance spaces do not usually permit the amplification of plants growing in natural surroundings, so this year I have been conducting a series of performances/installations in which I amplify an artificial, indoor 'ecosystem'. A room is filled with subtropical plants, which have already been acclimatised to life indoors. Four or more of the plants are connected to bioactivity translators, allowing us to listen in to the 'nervous system' of the plants. Electric fans are used produce an artificial 'weather system', which may vary from a light breeze to a strong wind during the course of the installation. As the plants' leaves begin to move, they activate light beam sensors which filter the bioactivity sounds, creating an ever-changing sound picture.

One of the most interesting performances of this work was at an event called 'Capture Brussels' in May 2001. The performance took place in the Halles de Schaarbeek, a vast metal-girded structure reminiscent of large Victorian railway stations, such as King's Cross in London. In the main hall, four Ford car bodies hung from chains from the ceiling. Each had a speaker inside, through which one of the artists would diffuse treated pink noise (a variation of white noise typically used to test audio equipment). My plant installation was in the smaller hall next door. We hoped it would be a space for relaxation, where the audience could lie on cushions on the floor and listen to the changing plant sounds. However, all did not go to plan...

On the night of the installation, many hundreds of people turned up, since the event was also some sort of party marking the end of an arts festival. When the performance began, they all tried to crowd into the small hall, since nothing much was happening in the larger space. Only one security guard was on duty, and he was soon lost in the throng. Many people seemed very sceptical that the sounds were actually being produced by the plants — perhaps they did not notice the small wires and electrodes. Some began to touch the plants to see if the sound changed, which it did. This much I had expected. But others, encouraged by this began to shake the plants violently, getting an even bigger change. Eventually, people began to grab the equipment itself, fiddling with the settings. The recording of the event is very interesting, even though it did not go to plan. For the first 20 minutes, the sound world of the plants slowly develops, and the sonic ecosystem sounds balanced. Then, as people began to handle the plants, they begin to emit sounds resembling yelps of pain! Finally, as people began to play with the equipment itself, the sound world is filled with increasingly noisy and chaotic sounds. It seems that the piece became a microcosm of man's activities on planet Earth, unbridled selfish activity damaging the ecosystem and sending it spinning out of control.

Given a different environment, the piece unfolds in a very different manner, such as happened at the Rising Sun Institute in Reading in June 2001, with a small but attentive audience. Candles were the only lighting, helping to create an atmosphere of group meditation. About 20 minutes into the piece, a strange thing happened. A pulse of energy seemed to travel through the room, and everyone opened their eyes at the same time to look for the cause. At the same time, the sound of all the plants changed drastically for a few seconds, and they all emitted the same, unusual sound. Several people asked me what this was afterwards, and I had to say it was a complete mystery to me — but it did seem like both plants and people were resonating together for a few seconds.

As I develop the means of realising more complex 'sonic ecosystems', I hope to give more audiences the opportunity of participating in such 'larger systems of mind'. I am sure that more surprises are in store, and perhaps such exercises may even help us to gain a greater awareness of our interactions with the natural world.

Sources:

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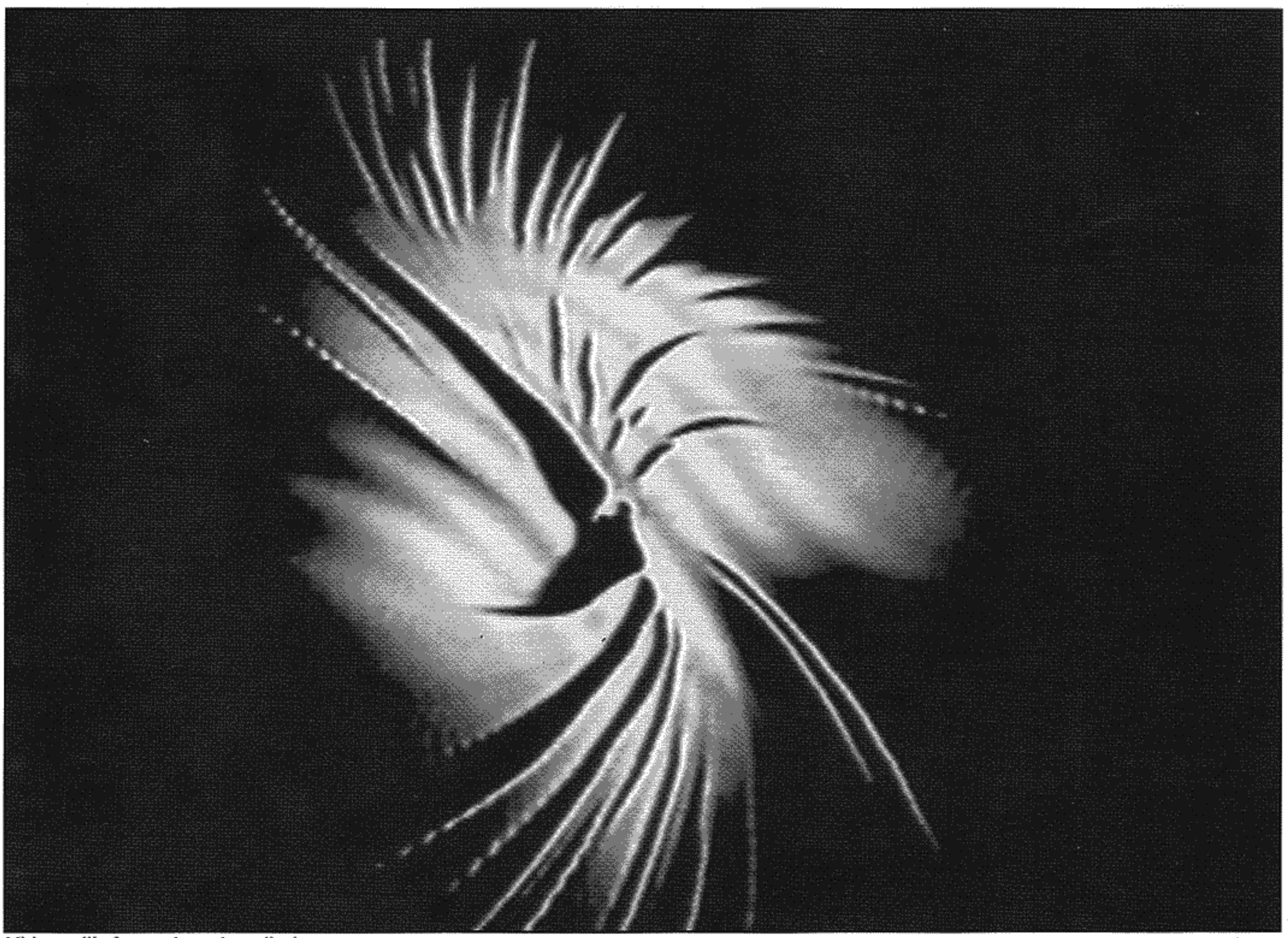
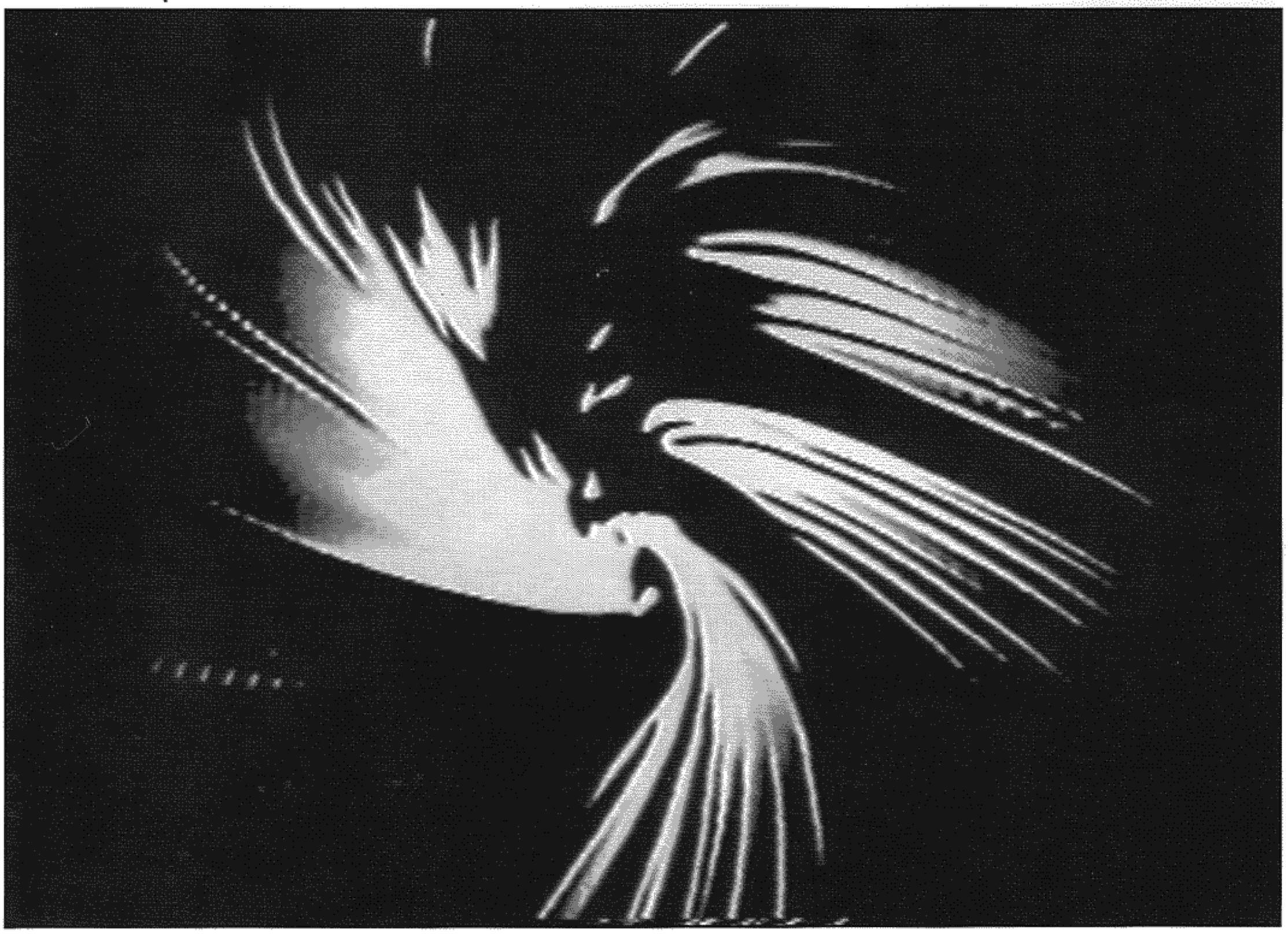


Video stills from phase installation



BARRY G. NICHOLS (ECM:323)
Electronic Feedback Systems

"Causality arises from a key concept of systems theory — the idea of feedback. A heater thermostat is an ideal example of a negative feedback system — a system which regulates itself and maintains a stable condition. Once feedback was defined and explored by information theorists and systems analysts in the 1940s and early '50s, scientists began to look for examples and analogues of it. With rising excitement they began to find similar stability-protection systems in every field from physiology to politics. Negative feedback appeared to be at work all around us, causing things to maintain their equilibrium or stability.

"By the early '60s, critics like Professor Magoro Maruyama began to note that too much attention was being paid to stability and not enough to change. What was needed, he argued, was more research on 'positive feedback' — processes that do not suppress change, but amplify it, do not maintain stability, but challenge it, sometimes overwhelming it. Positive feedback can take a small deviation or 'kick' in a system and magnify it into a giant structure-threatening shudder. Positive feedback could illuminate causation in many previously puzzling processes" (Alvin Toffler, *The Third Wave*).

THIS ARTICLE LARGELY DOCUMENTS ECM:323'S experiments with electronic feedback over four years with a variety of equipment, and represents our personal viewpoints and practices as opposed to a technically precise analysis of feedback processes.

The impetus behind our art installation work was born from the desire to examine critical relationships between sound and visual form, and how one might influence the other. This area of research emerged from the premise that physical, environmental, ambient, and even cosmic sound might provide access to the interpretation of objective, tangible processes which occur throughout the natural world.

Initial experimentation with a series of classic 'Chladni' vibration pattern experiments proved highly successful. Around 1787, Chladni was developing a previously little visited area of physics which eventually became the science of 'acoustics'. Using a metal plate scattered with fine particulate matter, he experimented with a violin bow drawn across the edge of the plate, creating subtle resonances. These resonances formed beautifully descriptive wave patterns in the material which settled upon the key 'nodal points' of attraction and repulsion. Chladni's experimentation yielded some 52 documented nodal patterns, now famously known as 'Chladni figures'. Our own experiments evolved empirically over a period of time, and we presented the results in finished form at The Museum Of Installation in Deptford under the heading, 'TEST SITES'. The TEST SITES series was to become the framework around which we developed and refined our working methods. By projecting precisely calibrated sine waves upwards through a membrane containing water, we were able to generate incredibly hypnotic fluid geometries — radiating hexagonal patterns known as 'Macrons'. (TEST SITES: Trace TS02) With relatively modest apparatus, and a rudimentary knowledge of physics it became possible for us to manifest sound as visual information.

Relatively recent breakthroughs in fractal geometry and the chaos sciences were revealing previously undiscovered truths about the nature of matter and pattern formation. It became obvious that there was a distinct cognitive connection between these sciences, and what we were trying to achieve artistically. Our discovery of a definitive paper by James Crutchfield (Centre for Non-Linear Studies, Los Alamos, California) rather grandly entitled 'Space-Time Dynamics in Video Feedback' provided the necessary link that we had been looking for. In his paper, Crutchfield uniquely and concisely links electronically generated video feedback patterns with an array of chaotic and fractal phenomena, and uses this method to analyse and illustrate chaotic behaviour. It became essential for us to explore the possibilities inspired by Crutchfield's paper using electronically generated audio and visual feedback signals. The option of using electronically generated feedback was a deliberate inversion of our previous works which dealt with more organic phenomena, for one simple and incontrovertible reason; electricity has largely been identified with the technology that is driven by it, and as human beings, we tend to overlook (or perhaps de-emphasise) the fact that we too are created and driven via electrical impulses. We are perhaps, largely unaware of electricity's pervasive influence throughout the natural world, and that we, and indeed all life depends upon electricity and electrical impulses. With this in mind, the perplexing philosophical question — 'Where does life come from?' is suddenly brought into sharp relief — it emerges from itself. Evolutionary biologist Brian Goodwin explains: 'The organism is the cause and effect of itself, its own intrinsic order and organisation. Natural selection isn't the cause of organisms. Genes don't cause organisms. Organisms are self-causing agencies.'

Life is thus an auto-conspired form. It emerges to transcend itself, a snake, swallowing its own tail, like the mythical symbol Ourobouros, which to many has come to represent the concept of feedback. Ironically, feedback systems are relatively simple to create — a portion of the output signal is fed back into the input of the same, or preceding stage of the loop. Students of cybernetics (the science of control systems) will recognise this as circular causality. As simple as a feedback loop is, it can be stitched together in endless combinations, and forever layered until it forms an unimaginable edifice of complexity and intricacy of subgoals, some of which cross their own paths — A triggers B, B triggers C, and C triggers A. In outright paradox A is both cause and effect. Hackers know this phenomenon as a recursive circuit — nevertheless, whatever the riddle is called, it totally undermines classical theories of everything. If something can be its own cause and effect, then rationality is up for grabs.

My introduction to working with feedback was via electronic composer Peter Hodgkinson (of T:un[k] Systems and Mechos), with whom I was collaborating. He introduced me to a unique feature of the Behringer Eurorack 802 mixing desk, which generates feedback when two effects are thrown together. The Behringer manual dryly states: 'when using Aux Send 1 as a second pre fader effects send, DO NOT engage S16. The connection from Aux Return to Aux Send 1 would be illogical, and could cause feedback.'

Of course, we became fascinated with the possibilities yielded by this idiosyncratic feature, and Mr Behringer's warning was too much of a temptation to resist! Peter had composed tracks utilising the feature and demoed them to me at his then London home studio. I quickly recognised that here was a way of using audible

electronic feedback to emulate analogous natural systems, (as, of course, they are both governed by the same rules) and began experimenting with various effects through my own Behringer desk. My first successful recordings demonstrated moderate control of the equipment in order to generate some astonishing tonal feedback works, which were performed at the South London Gallery through a struggling PA system (ECM:323 — Test Site TS:02, August 1998 & CD release, Sound Factory –SFSLG 01).

As artists, we came to regard electronic feedback as an incredibly fascinating medium, and a rich source for our creativity, not least because it could be said to be a precursor to the recent development of software based 'Generative Music'. Practising electronic composers will no doubt realise that feedback oscillators are a fundamental feature of all synthesised electronic sounds — without feedback, synthesisers would be almost useless. The creative potential resulting from the outgrowth of unprocessed feedback is almost limitless. From our own personal experiences it would appear that serendipitous feedback events arise from moments when the human has little or no control over the equipment from which it originates. Given that electronic feedback systems, whether audible or visual, draw from a vast array of variables, the potential to create new, coherent forms is, for us, tremendously exciting.

The compounded logic of the previously mentioned stacked loops which double back on themselves, becomes the source of the strange counterintuitive behaviours of complex circuits. Engineered under precisely controlled conditions, these electronic circuits normally perform dependably and reasonably, but then suddenly, and by their own drumbeat, they veer off without notice. In industry, electrical engineers are paid to outfox the lateral causality inherent in all circuits. When pumped up to the density required for a robot, circuit strangeness becomes indelible. Reduced back to its simplest — a feedback cycle — circular causality becomes a fertile paradox.

When we encounter these patterns for the first time, (especially in video feedback) it is not unreasonable to treat them as our own offspring — we are intensely aware of the fact that these self-same variables are imposed upon the creation of biological forms, and it requires no great leap of the imagination to assume that in all forms of electronic feedback, we may be privy to the creation of the first generation of genuinely post-biological life. This may be straying a little from the strictest interpretation of the application of electronic feedback systems. However, it may be enlightening to project forward into the future potential of the medium. Although speculative literature concerning the development of Artificial Intelligence is replete with dystopian sci-fi scenarios where human life is superseded by machinic superiors, it might be more realistic to imagine a more harmonious evolution occurring.

We are now well into an era where musical software is capable of randomly feeding back and mutating. In fact, our increasingly complex computer systems are more than capable of creating their own surprises. In an imagined scenario not so many years from now, we can expect some startlingly original glitches to arise spontaneously from intelligent machinery. It will almost certainly be that musicians will be able to create algorithms which generate and harness audio forms, and enable them to evolve and propagate of their own volition, using the rules of positive feedback, combined with random mutation.

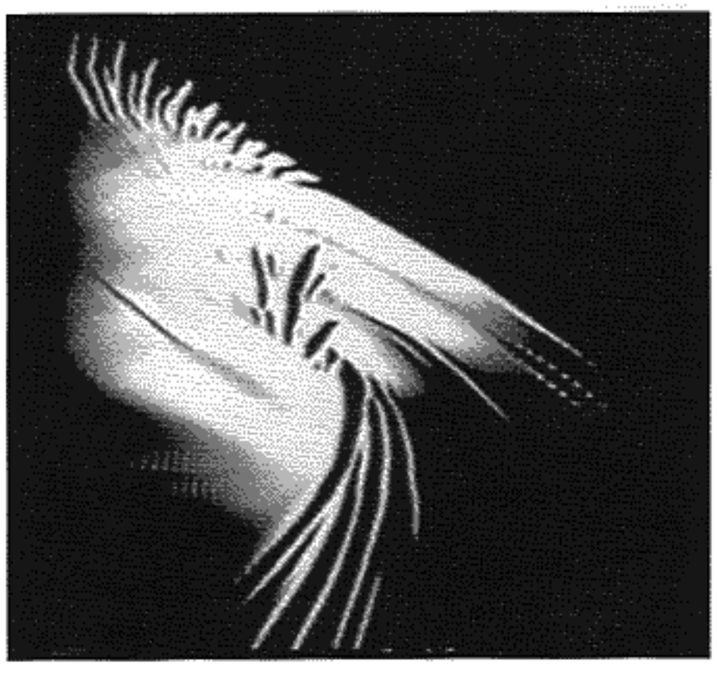
In his book *Mind Children* (Harvard University Press, 1988), MIT luminary Hans Moravec envisions a time when self-replicating digital life-forms in the form of viruses will be intelligent enough to plan and act in a deliberate, calculating, and creative manner in order to engineer their own survival. Not only will the data realm be populated by its equivalent of rats, sharks, and criminals, but also by flowers, trees and songbirds. Naturally, the musicians will embody their creative software with these viruses in order to 'grow' their own music. In fact, it is highly likely that musicians will have the ability to 'farm' and harvest their own audio viruses, giving rise to an expansive network of interactive musical distribution.

Our most recent audio visual installation 'PHASE' (Test Site TS:05) demonstrates our exploration into this possible future by combining a generative video feedback form with an audio feedback soundtrack. 'PHASE' encapsulates "a system in which the normally serial circuitry of audio visual apparatus is transformed into a closed, circular loop by the disarmingly simple expedient of re-orienting the camera to point directly at the monitor screen" (from an installation catalogue, Royal Society of British Sculptors 2001). The net result is beautiful, yet alien, and has taken audiences by surprise, especially when confronted with the fact that neither of the two elements were created via software, and that in fact, we literally 'captured' what we discovered, using minimal human intervention except when editing out the less aesthetically pleasing content. Our own description of the installation contends: "Feedback loops result in the generation of complex spatial and temporal patterns and structures analogous to those found throughout the natural world" — offering a possible model for relationships between circular, iterative systems and far more complex forms of natural behaviour.

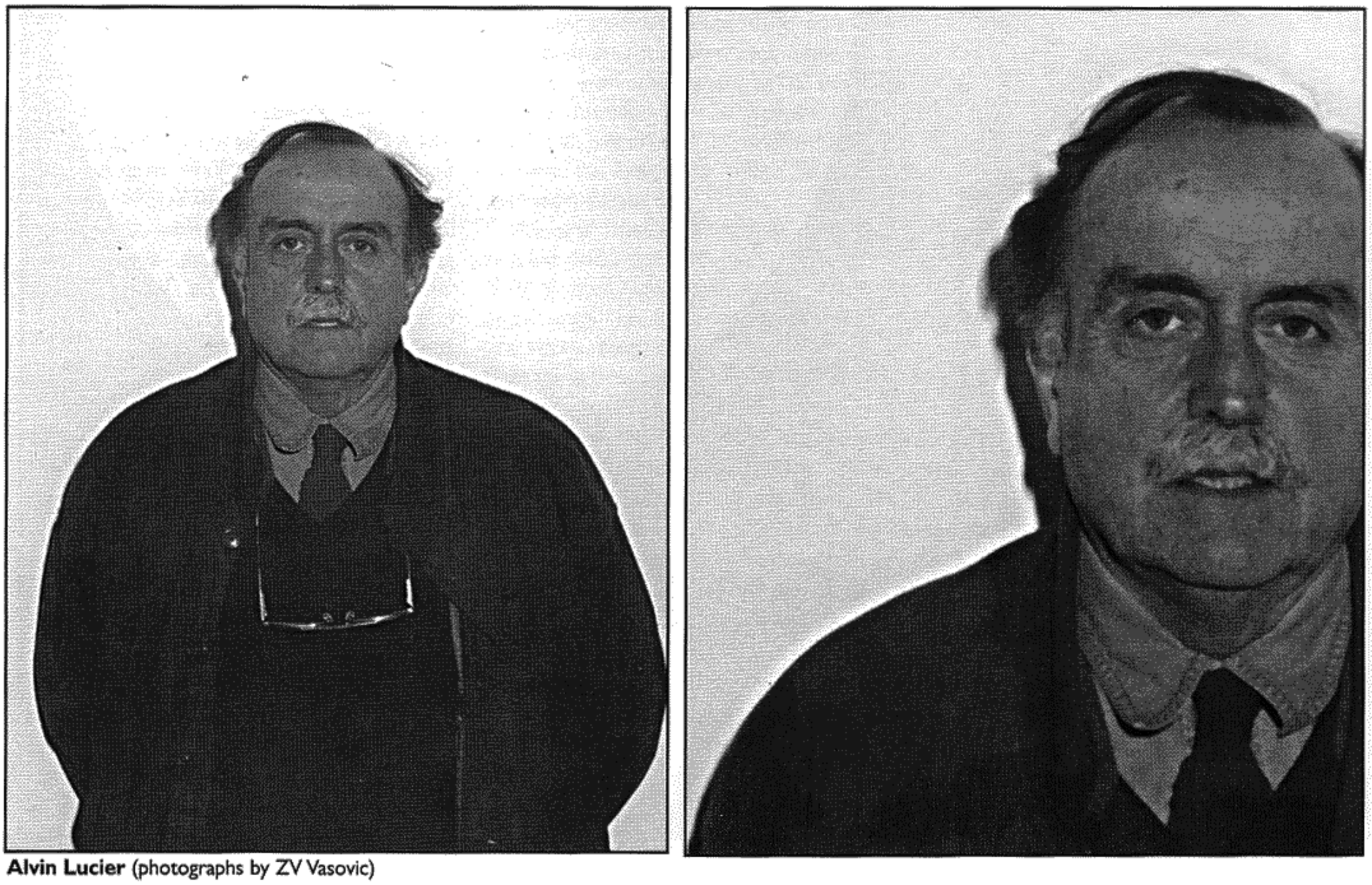
This stage in our creativity hints at future excursions into the areas of Artificial Intelligence and information systems, currently being researched under the working title 'Hemispherics'.

"Because positive feedback breaks stability and feeds on itself it helps to explain vicious cycles — and virtuous ones. When we put negative and positive feedback together and see how richly these two systems interplay in complex systems like the human brain or the economy of a country, startling insights emerge. Indeed, once we as a culture recognise that any truly complex system — whether a biological system, a city or an international political order — is likely to have within it both change amplifiers and change reducers, positive as well as negative feedback loops interacting with one another, we begin to glimpse a whole new level of complexity in the world with which we are dealing. Our understanding of causation is advanced.

"Yet another leap in understanding occurs when we further recognise that these change reducers and amplifiers are not necessarily built into complex systems from the start; they may be absent at first, then 'grow' into place, sometimes as a result of what amounts to chance. A stray event can thus trigger a fantastic chain of unexpected consequences. This tells us why change is so often hard to track and extrapolate. It is why a slow, steady process can suddenly convert into an explosive change, or vice-versa. This in turn explains why similar starting conditions in any system can yield sharply dissimilar outcomes" (M. Mitchell Waldrop, *Complexity - The Emerging Science At The Edge Of Order And Chaos*).



ALVIN LUCIER
My Affairs with Feedback



Alvin Lucier (photographs by ZV Vasovic)

ON THANKSGIVING DAY, 1975, WITH NOTHING BETTER TO DO, I SPENT the afternoon in the Wesleyan University Electronic Music Studio. I began experimenting with panning the sounds of an electronic birdcall between two loudspeakers. I had recently received the birdcall in the mail from sound artist Doug Kahn, whom I had never met. The birdcall was actually a Christmas tree ornament, a baseball-size silver ball, containing a sound-producing circuit, a miniature amplifier and loudspeaker. It emitted endless repetitions of a downward glissando followed by a series of repeated chirps. Kahn said he thought I might find a way to use it in a musical work.

I had also just acquired a pair of miniature Sennheiser binaural microphones, designed to be positioned on either side of a dummy head or worn in human ears, in order to make realistic recordings. By moving my head back and forth rapidly I was trying to produce short time delays or, since that seemed unlikely, perhaps I would discover some other interesting phenomenon.

At one point, as I was standing in the middle of the room, feedback started to sound. Before I could get to the amplifier and lower the volume control I began hearing phantom images of the birdcall, which seemed to come from inside my head and at the same time to be located in various parts of the room. They were amazing. What I was hearing was heterodyning, a term in radio technology describing beat frequencies produced between two radio frequencies, of which one is usually a received signal-carrying current and the other that of an uninterrupted current introduced into the apparatus. In this case the phenomenon was produced by the interaction between the continuous strands of feedback and the sounds of the birdcall, both within the audio range.

Often the resultant phantom shapes were simply lower transpositions of the original. At other times they were mirror images. If two or more strands of feedback sounded at once, double images might sound simultaneously.

It is difficult to pinpoint the frequencies of the birdcall exactly — the call is noisy — but careful listening puts the start of the swoop at approximately 880 cycles per second, the repeated chirps at 660. The feedback frequencies that produce the most vivid phantoms are in the range of 1750 to 3000 cps. The phantoms themselves sound in the lower mid-range, from approximately 250 to 700. I had originally thought that the images were simply resultant or difference tones. If the feedback sounded above the birdcall, as the birdcall swooped downward, the distance between it and the feedback grew smaller; the resultant tones were lower. If the feedback occurred above, the resultant tones slid upward, as the distance between the two sounds increased. But because of the disparity between the frequency range of the feedback and that of the birdcall, the phantoms must be some form of harmonically related beat frequencies caused by the interaction of a fixed frequency signal (feedback strand) and a search tone (birdcall). Whatever these phenomena might be called, including resultant tones, heterodyne components or inter-aural harmonics occurring only in the brain of the listener, the results are spectacular. Listeners can hear them vividly. The piece is called *Bird and Person Dyning*.

In numerous performances over the years I have developed a simple set-up consisting of the birdcall mounted on a mike stand and positioned in the front middle of the space flanked by two stereo loudspeakers. The birdcall sounds by itself; it is not mixed into the sound system. The binaural mikes are worn in the performer's ears, routed by long cables through a mixer with

compressor-limiters and amplifiers to the two speakers. Before the performance the performer, with the help of the a sound technician, searches the space for room resonances whose sonic manifestations as feedback, cause heterodyning. During the search process the sound technician uses equalization to help bring out resonances in this frequency range.

The performance simply consists of the performer moving slowly around the space searching for phantoms. When I perform the work I usually move through the audience, toward the birdcall and speakers, stopping briefly when I hear heterodyning. I tip my head from left to right, to fine tune the results and move them to various points in space. The spatial relationships between the binaural microphones and the loudspeakers determine the geographical locations of the phantom birdcalls. I relish the theatricality of the situation. Sometimes the results are vivid — transpositions and their mirror inversions occur. At other times, however, the room just produces a few unwanted resonances. The performer accepts the task of finding the appropriate strands of feedback that create phantom images of the birdcall. The performance is not an improvisation.

It wasn't until 1994 that I used feedback again for musical purposes. I was asked by Wesleyan University to present a festival of my work. I decided to make as many new pieces as I could rather than resurrect old works to form a retrospective. I made 16 new pieces in one year, most of them prose scores, others simply were verbal instructions. One was a work for Javanese gamelan instruments. For many years I had hesitated to use non-Western instruments in my music. There had been too many such works that seemed to me to smack of chinoiserie. Then too, I didn't want to intrude on the Wesleyan gamelan master musicians' time and energy. They had enough to do to maintain a coherent program in traditional Javanese music and dance. But more important, I didn't want to exploit someone else's music.

However for several years I had a specific idea about exploring the acoustic properties of certain gamelan instruments. I felt comfortable in doing so rather than referring to the actual music or some hybrid form of Western and Javanese styles. I thought of the bonangs, bronze bowl-like gongs of various sizes, as small environments, the resonant frequencies of which could be revealed. By inserting microphones into the cavities of these instruments and bringing the amplifier gain up to the level of feedback the resonant frequencies would sound. The resulting pitches are variable and unstable and bear no relationship to the struck pitches of the instruments themselves. Often the feedback changes pitch without warning. More often it depends on how deep into the opening the microphone is inserted. Sometimes two pitches sound simultaneously or oscillate in a kind of trill.

Before the performance four performers choose any number of bonangs at random. During the performance they lift them over the microphones mounted on boom stands. As the bonangs sound three gender (metallophone) players search for the feedback pitches by tapping series of tones, searching for any one of the feedback frequencies. Since it is statistically improbable for any gender and bonang pitch to match, audible beats happen at speeds depending on the distances between the pitches. The farther apart, the faster the beating. And since the pitches of the genders are fixed and can't be bent, no unisons are possible. To offset that limitation the players slow down and speed up their tapping, arriving at temporal 'unisons' with their feedback pitches. The speed of their tapping comes into synch with the speed of the audible beating between the pitch of the feedback and that of the gender. This slowing down and speeding up is an indirect reference to Irama, a Javanese musical structure in which certain instruments slow down while others speed up, gradually doubling and halving the tempo simultaneously. The score of *Music for Gamelan Instruments, Microphones, Amplifiers and Loudspeakers* consists of a set of instructions as well as number systems for the players to follow, allowing for many possibilities in pairing the genders with the bonangs.

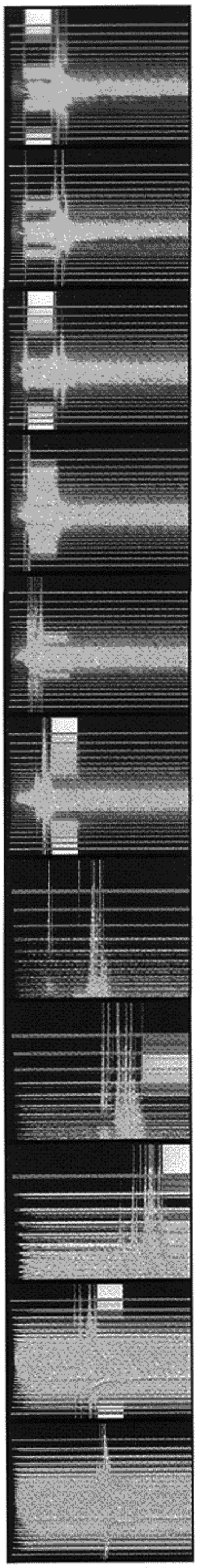
In 1997 I composed *Small Waves*, a 56-minute work for string quartet, trombone and piano with six partially filled water containers. The work was commissioned by the city of Zug, Switzerland, and was first performed there by Hildegard Kleeb (piano), Roland Dahinden (trombone), and the Arditti String Quartet. In this work microphones are inserted into the mouths of small glass jars and vases. When the volume levels of the amplifiers are raised to feedback level the resonant frequencies of the containers are sounded. Throughout the performance the musicians play long tones in upward and downward scanning patterns, creating audible beating which slows down and speeds up as the tones approach and pass the resonant frequencies. From time to time water pourers empty water from one container into another, lowering the pitch of the former, raising the pitch of the latter.

There are six microphones, one for each vessel. The size and characteristics of the microphone and its displacement of air in the container were crucial to the pitch it produced. By pairing each vessel with its own microphone I could ensure that the feedback frequencies were similar each time I set the piece up. It was important, too, that the mikes be lowered into the vessels to the same depth each time. Even with these precautions, the system was so fragile that often I couldn't replicate the exact same pitches. The players' scanning patterns often cross the resonance tones, however flat or sharp they might be. Even when unisons are supposed to be reached, their out-of-tuneness is not bothersome. You cannot expect found objects to match exactly the pitches of our tempered scale. Anyway, the rhythms of the beating patterns are more important than accurate tuning.

In a recent recording of *Small Waves* sound engineer Tom Hamilton asked me why I didn't simply use sine wave oscillators instead of hard-to-control, unstable feedback. I wasn't sure why at the time. Then we measured (tuned) the frequency of the feedback from several vessels and discovered wide deviations in pitch and loudness within each vessel. The variations were in real time. The feedback resembled a living organism.

In that same year I presented a sound installation at the Donaueschingen Music Days in Germany, using a similar set-up. In *Empty Vessels*, eight large melon jars and vases were mounted in a row on a slightly raised stage one side of the room. Microphones on boom stands were inserted into the mouths of the vessels and routed through compressor-limiters and amplifiers to loudspeakers, one for each vessel, hidden behind a curtain on the other side of the room. As visitors entered the space — a school cafeteria, the walls of which had been hung with black drapery — the movement of their bodies disturbed the feedback strands causing ripples of sound, as if in a pool of water. Not only did horizontal movement across the strands cause discernible effects but perpendicular movement as well. People moving toward the vessels caused variations in pitch and dynamics. Every once in a while a vessel would actually stop sounding.

For a few hours each day I would relieve the technician guarding the sound equipment hidden in the balcony. Without looking I knew immediately when a visitor had entered the space by hearing ripples of sound, sometimes very slight changes in equilibrium. It was gratifying to me to see visitors of all ages and types interact with the system. Most of them immediately understood what was happening. The townspeople of Donaueschingen, many of whom do not as a rule attend the scheduled concerts, were regular visitors to *Empty Vessels*, as well as the several other sound installations mounted in various venues throughout the city.



ROB FLINT
Performance, Feedback, Noise, and Moving Pictures

"Any system that has amplification, and has a positive coupling between its input and output is unstable, and when either the amplification or the degree of coupling reaches a critical level, it will go into oscillation" (Vivian Capel, *Acoustic Feedback — How To Avoid It*, London: Babani, 1991).

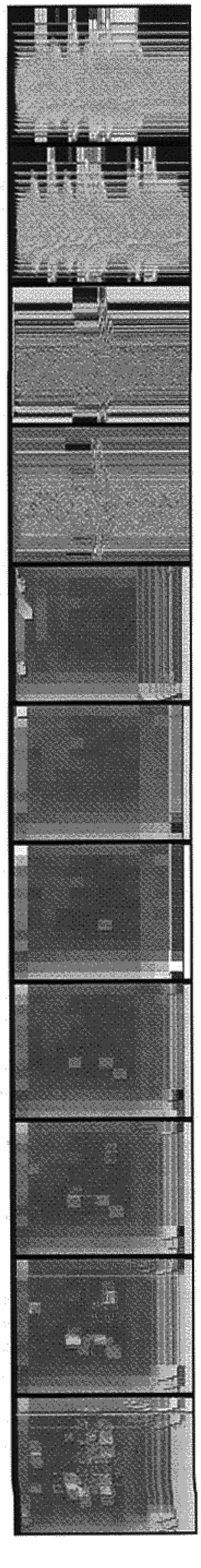
VIDEO IS THE BASTARD CHILD OF A BASTARD medium. Like its celluloid parent it is parasitic on the auditory and visual media from which it is derived. It is a convergence of modes — sound, light, colour — and forms — drama, musical performance, documentary — in a manner that has been the pattern for all new media since sound and moving pictures were united. For artists in the 1960s, following the modernist prescription outlined by American writer Clement Greenberg — to use the medium to define itself, and its own specific properties, (the 'painterliness' of paint, etc.) video proved a difficult task. Soiled by its association with television, and its inability to inherit the hard-won dignity of film, video was a de facto challenge to definitions of modern art as a triumph of medium specificity and to the assertion of 'Art' objects as something distinct from other popular forms.

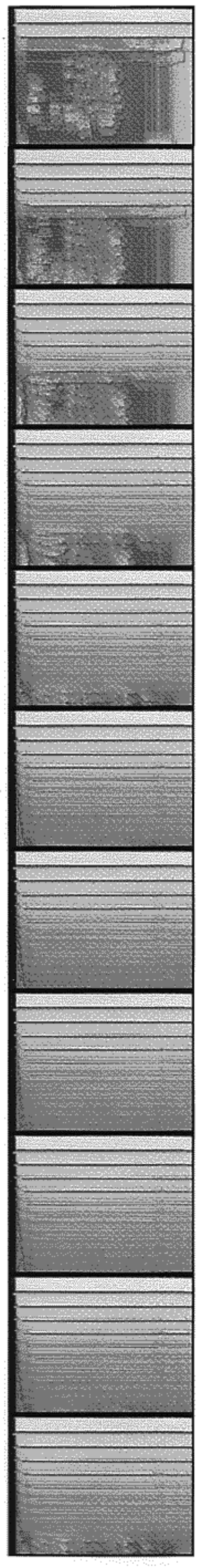
Maybe it was for this reason that early experimental video art usually involved interfering with the existing signal, but it was also because video cameras were large, unwieldy, and financially beyond the reach of all but the most heavily subsidised artist. There is some debate about who was first, but I'm going to settle on Wolf Vostell, a Fluxus artist from Germany, who stuck some magnets on the back of some television tubes in a gallery in Wuppertal. This is still possible for anyone to try at home. It's fun, and to a limited extent interactive, as you can move the magnet, or magnets around, and because of their pull on the particles inside the cathode ray tube, they make a satisfyingly irreverent distortion to the image on the screen. And, in the age of colour television tubes, they mess them up too. For Vostell and the Fluxus people, it was a principle clearly rooted in avant-garde activity from much earlier in the century, a calculated interference with — it may be more fashionable now to say — 'intervention in' — pre-existing media. What the Situationists called 'detournement'. And when, in the 1920s and 30s, John Heartfield and Hannah Höch stole the idea of cutting and pasting bits of pre-existing photographs from the Prussian Army's method for economising on regimental group portraits, they similarly were making 'noise' in an existing representational system. And it was risky noise too, especially for Heartfield, whose reordering of existing media took the form of living in Berlin and taking the piss out of Hitler during the rise of Nazism. The stakes were slightly higher then than for most new media outlaws.

The problem with showing Heartfield's and Höch's work to people now is that it is technically easy to perform acts of montage with different kinds of image by scanning them and pasting them together on a program like Photoshop. And half the subversive and surreal charm of Höch's huge heads on tiny bikinied bodies lay in the fortuitous coupling of just the right kind of errors of scale to mock the other kinds of distortion generated by the media from which they came. So they are museum pieces now, these engaged little pieces of art, separated from the scary time and place from which they came by the kind of canon-constructing machinery I described above. Similarly, although Vostell has not entered the museum quite as decisively as Heartfield, Höch, and their fellow Dadaists, the act of distorting the surface of the video image now has software specifically dedicated to it. Vostell himself has been upstaged a bit by fellow Fluxus artist Nam June Paik, who has become one of the big names of Video Art, and whose work takes the montage principle pioneered in film by people like Dziga Vertov and Eisenstein, to its full, multi-screen extent. Let's not forget here that 'noise' can also sometimes be called 'static', and that to be static means to be not going anywhere...

The problem with media disruption as a subversive tool is that it always becomes a new form to itself, but this 'becoming-form' can be a moment of real change. Jaques Attali's book *Noise* describes well how this takes place: 'But a noise that is external to the existing code can also cause its mutation. For example, even when a new technology is an external noise conceived of as a reinforcement for a code, a mutation in its distribution often profoundly transforms the code.'

He gives the example of audio recording





technology, originally intended as a reinforcement and amplification of speech but which had an unforseen 'impact on the status of the contents of that speech. The network modifies the code within which the messages are expressed.'

In other words the existence of recordings changes the kind of things that are recorded. It creates a kind of self-consciousness within the activity of speaking, or for that matter, of making music.

Obvious visual examples also present themselves. Photography — those still life photographs of fruit and game so urgently 'composed' by Victorian amateurs, who wanted it to replace painting only in the sense that it made it incredibly easy for them to make pictures. In doing so, they failed to realise that, although it would certainly not replace those paintings, it would utterly transform their meaning, and their necessity. In this sense photography introduced a kind of visual feedback into the image before electronic amplification came along.

And there was already a model for it in the allegorical use to which mirrors were put in a whole bunch of different paintings, Velasquez's *Rokeby Venus* and *Las Meninas* being two of the more celebrated examples. In these the fact that a picture can also contain a picture becomes an opportunity for a rarified meditation on the role of representation as a mirror of truth, and its contradiction — that the more apparently 'truthful' the representation, the more skilled the artful deceit. The Quaker Oats Breakfast Cereal box was a powerful childhood lesson in the sheer weirdness of fictions if you thought about them a bit. On the front of the box the cheery and rubicund Quaker clutched a box of Cereal Oats on which was depicted himself clutching a box of Cereal Oats on which was depicted himself clutching a ...etc. Where did it begin? The simulacrum made flesh. As a child though, I experienced this not as a salutory reminder of the instability of hegemonic Western representational modes, but as a giddy vertiginous expansion of the imagination, like walking around the house clutching a mirror facing upwards at waist height, which if done for a sufficient length of time gives the joyous sensation of floating on the ceiling.

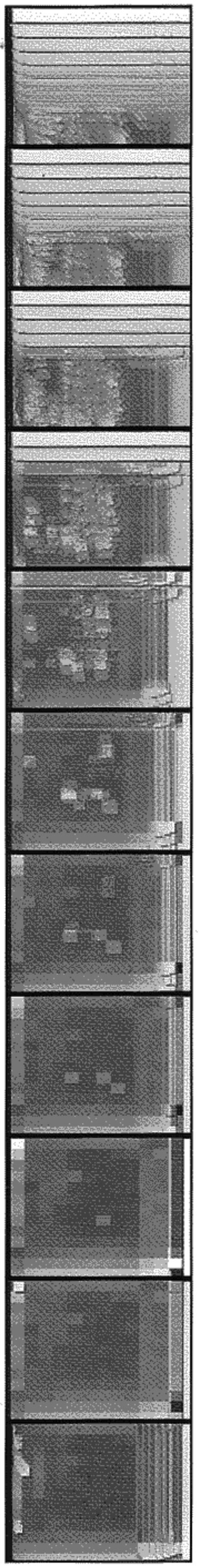
Perhaps it was only when photography introduced its indexical empiricism into the world of pictures that this became a particularly disturbing problem. Shakespeare famously introduces a play within another play in *Hamlet*, but its function here is clarity rather than interference, being a sort of mental healthcare for the lugubrious prince, objectively affirming his until-then possibly hallucinatory suspicions about his uncle.

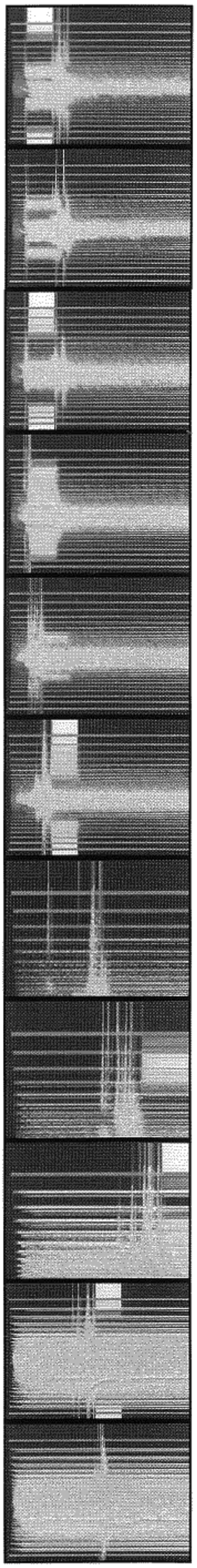
The phenomenon of feedback as self-referentiality so acute that it creates noise within the loop, is essentially a modern phenomenon, and it is closely linked to the supposition that new technologies are supposed to neutrally 'amplify' a signal, without producing a signal of their own. Feedback is the sound of their objecthood being superimposed on their objectivity. It suggests that there may in fact be no such thing as repetition...

Technical manuals correctly describe feedback as 'oscillation in an unstable system,' but it has an everyday meaning that is maybe more literal — the recycling of a material output in a kind of short-circuit, producing a third party material in the form of a prolonged and automatic echo. In communications it has a positive definition — the opposite of noise — a productive process through which the addresser listens to the response of the addressee in order to assess the flow of communication. Formal education and corporate training situations are littered with 'feedback sessions'. In all these areas the designation of 'noise', as the antithesis of communication is deeply context-specific, as of course it must be, just as in the auditory realm, and in this publication, these designations are productively confused.

It is precisely upon the instability mentioned above that the connection between feedback as a technical phenomenon, and as a metaphor of communication meet. And it is as much the aesthetic of instability, the image or idea of feedback as paradigmatic of chaotic, nonlinear, systemic collapse, that gives it a cultural meaning pregnant with oppositional force, in a passage of thought that is found in contemporary music's preoccupation with analogue 'noise', but that has echoes in Jimi Hendrix's distorted rendition of the *Star Spangled Banner* at Monterey. And what an ambivalent sign that example is. Usually viewed against the backdrop of the Vietnam war as an irreverent abuse of the US anthem, are those in fact patriotic whoops of recognition we hear in the crowd? And Hendrix himself — oscillating between the roles of autonomous agent of guitar innovation, and dissolute Romantic victim, virile axe-hero and lysergic puppet. The variance of performed feedback is between control and its opposite, between autonomy and the subjective dissolution of the creation without creator.

Marshall Mcluhan said that 'the content of any medium is always another medium' — the content of writing is speech, the content of print is writing, and so on. Feedback in electronic media is when the





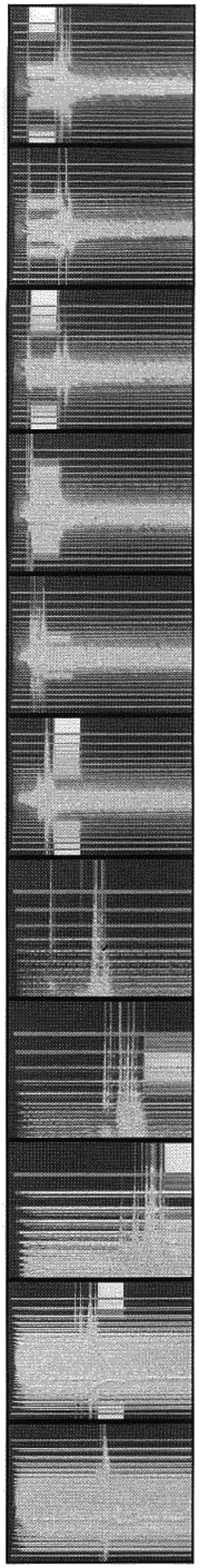
content of the medium is the medium itself, but itself tranformed. It is the instability at the heart of it, the fact of its material supports. Feedback in this sense is inseparable from the amplification of the signal. It is the very air in the room that provides the 'positive coupling' described in the quotation at the start, and no-one has described and used this phenomenon better than Alvin Lucier, whose astonishing sound-work *I Am Sitting In A Room* takes the phenomenon of feedback and applies to it the same treatment dished out to Zeno's arrow, breaking the feedback loop down into infinite subsections and introducing a kind of cinematic time into sound, treating feedback's characteristic howl like a crashing car in an action movie, whose slow arc describes the temporal space of cinema itself — the basic stuff the director is lucky enough to get to play with. Similarly Lucier's declared ambition is to describe the physical space of the room as literally as possible by means of its resonant frequencies revealed by his own voice. In doing so he makes a thoughtful use of minimalist techniques: repetition as a developmental, rather than static process; and the creation of work by other than expressive means. In much the same way visual artists of the seventies created reflexive, elegant works from impersonal parameters like mathematical equations, domestic striplighting, or the given length of store-bought timber. Although materialist in its destination, operating, as is characteristic for Lucier, through unpretentiously simple technical means, *I Am Sitting In A Room* describes and makes material the immateriality of the time of sound. In doing so the feedback that describes the room's resonant frequencies gradually effaces the sound of the artist's voice with its own resonance.

Feedback in video doesn't quite have the immediacy of Lucier's fortuitous collaboration between the equipment and the room. David Hall made a similar gesture in the late 1970s, recording and rerecording newscaster Richard Baker to the point of illegibility, provoking an awareness of the image as a material effect, rather than a transparent truth, but this work, though compelling, seems to map deterioration only, rather than creating a new thing from the loop. Perhaps it is because of the different kind of attention accorded to sound that Lucier's work feels more than didactic. Direct feedback made by directing a camera onto its own image gives a kind of 'Quaker Oats' infinite regression to any object suspended between the lens and the feedback screen, a bit too reminiscent for me of the trippy mandalas and infinity tunnels beloved of the screensave programmer, but the kind of feedback created from direct input and output on a video tool, such as a mixing desk, creates a continuous movement of planes of colour, the raw component colours of video. It is unstable, like its audio equivalent, and has no 'essential' nature, being as much a product of the kind of screen, tube, or projector on which it is shown, as of the generating technology of the desk and its inputs and outputs. Every point in the chain is of equal value in its determination of the nature of the output.

A video mixing desk, (aka 'vision mixer' or 'video switcher') is a tool designed primarily for the fundamental task of the film editor — managing the transitions between different image sequences. But it is also itself a kind of transitional object, having one foot in the world of analogue editing, where it would form part of a suite including video tape players, and, owing to its effect-generating property, the other foot in the now ubiquitous world of digital video whose nonlinearity has almost entirely replaced realtime tape editing. As a live tool it processes video and audio input on the fly, allowing ongoing decisions and changes in the output. But as with the role of the disc-jockey, the original 'selecter' of the Jamaican sound clashes, the very act of managing the transition between different 'contents' can itself become 'content'.

It is something of a Postmodernist truism, this reversal of values, of the confusion between frame and picture, medium and content, high and low, centre and margins, etc, and is well exemplified in the new etymology of the word 'artefact'. Familiar from its museum usage denoting the difference between the things in the glass cases and the rest of the things in the room, its new, improved, digital meaning now describes the unintended creations of equipment or programming error. The new noise, in fact. In video practice, as in sound, much of what was formerly considered 'error', and 'noise' has become part of the language of the media themselves, elements of 'glitch' audio and video being used in adverts and TV program idents as the process of their becoming aesthetically legitimate. It is probably unneccessary for me to tell the readers of this publication how the glitch has emerged as a musical form in its own right, and that lots of new realtime performance software exists with the purpose of exploiting these artefacts as live music...

In the work I do with the group Ticklish I've tried to use the cliches provided by the mixing desk itself, its various transitions, wipes and fades — all the tools designed to ease the stressful passage from one image sequence to another — as the content itself, rather than the frame that surrounds



it. In this I am shamelessly influenced by the recent electronic musical preoccupation with artefacts, errors and glitches, but also by the pioneering abstract and experimental film-makers like Hans Richter, Len Lye, and Kurt Kren, all of whom in different ways drew attention to the artifice and 'noise' of their particular medium by reflecting on its processes.

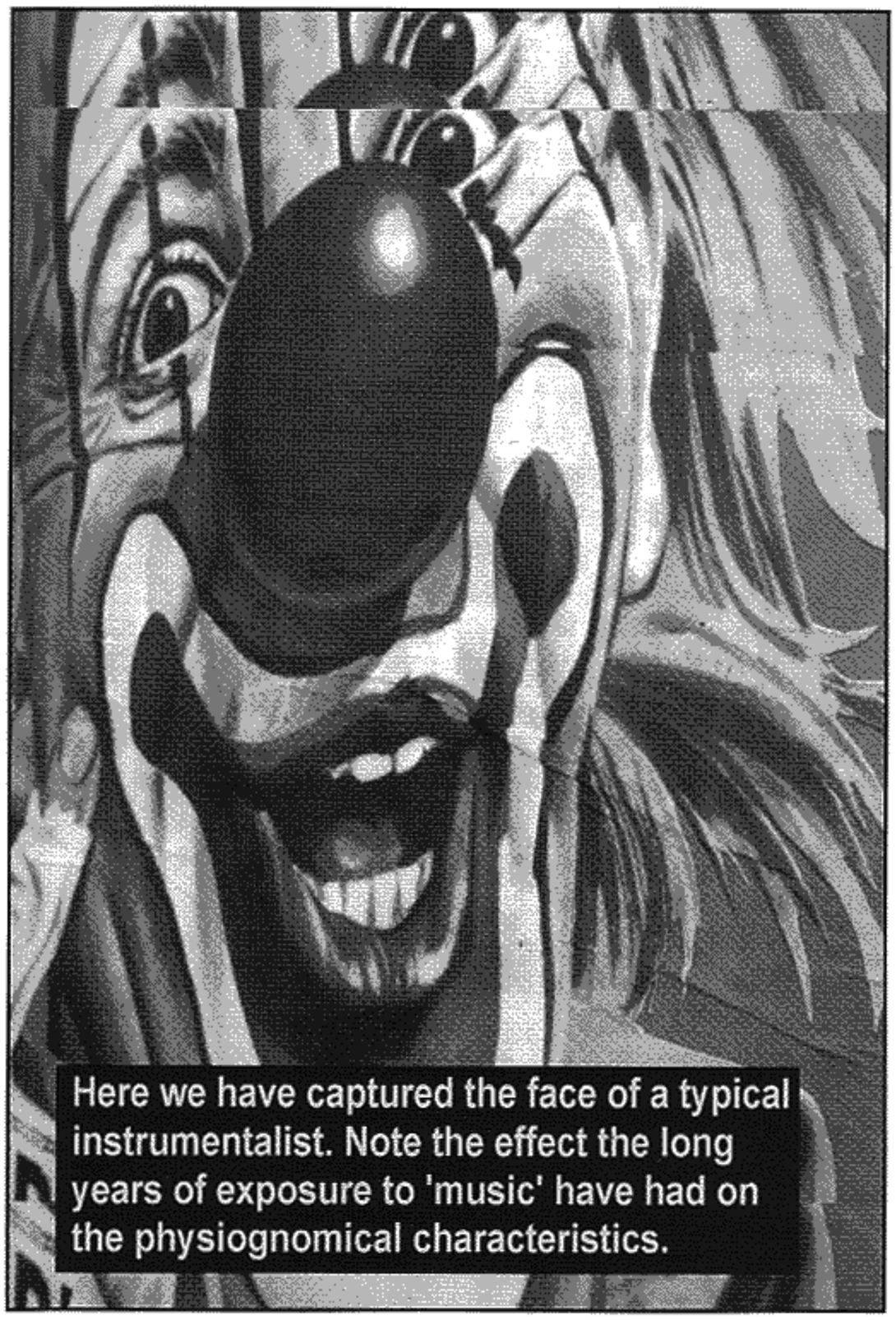
In this I know I am open to charges of empty formalism, or of a kind of technological determinism. It is certainly out of step with a lot of contemporary video art practice that generally favours narrative of some kind, and the immediacy of the handheld, low-tech video image as an opposition, conscious or not, to the high production values of feature films, adverts, and pop promos. The difference (I hope) lies in the uses of video as a part of live performance. Neither content or duration are fixed. As well being a useful resource of corny transitions, the mixing desk provides a way of working with images that permits a physical interaction with the process that is wider in its scope than moving a cursor around on a screen. In a deliberate reversal of the customary relationship between music and moving pictures, I can follow the sound with the image, rather than the other way around, up-ending the more familiar role of the musician invited to provide a soundtrack for an existing image sequence in the manner of the 'vamper' pianist of silent cinema.

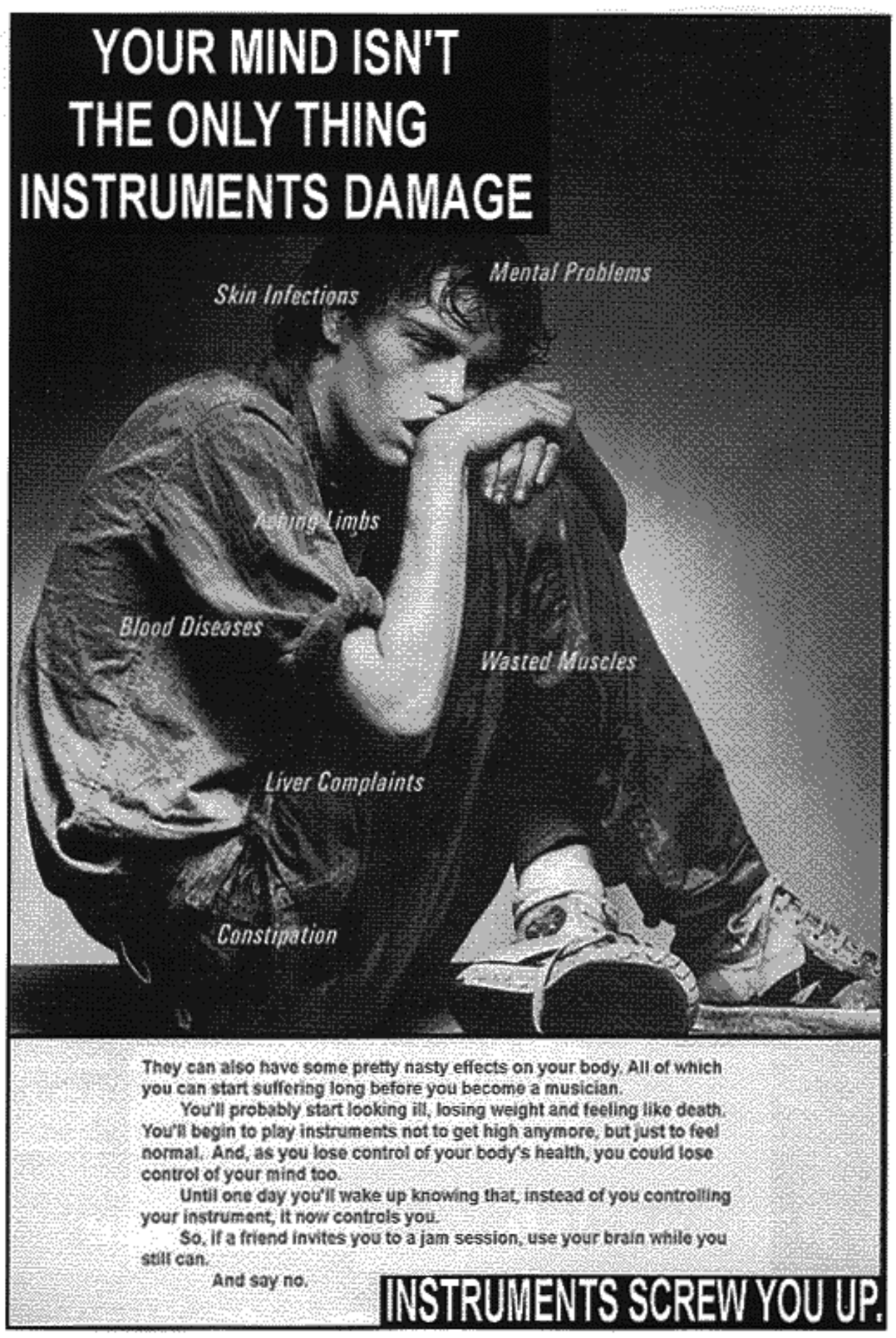
As one of a generation of white boys who grew up through the change from music being a moody solitary experience, more literary than physical, to the wordless beats and sweating dance floors of acid house and after — through the expressive posturing of punks to the faceless anonymity of DJs, I'm interested in the condition of being 'between' these situations. What is a 'live' performance in the era of the perfect copy? And what does it mean to 'improvise' with the idea of cinema, and with the kind of attention that cinema implies? When is music serious?

The moment of this confusion is productive. Uncertainty about the kind of attention that should properly be paid to things generates new thoughts, as new justifications are formed and reformed for likes, or dislikes, interest or boredom. This discussion has existed for musicians for a long time, of what constitutes 'live' and 'improvised' music, of how to develop technical skill but remain a social being. And how to live and work in between the common sense idea of music as something to do with tunes and scales, and the suspicion that the distinction between 'noise' and 'music' might be an arbitrary one.

And in more general terms, hasn't the whole drive of selfconsciously 'avant-garde' and experimental practices in sound, images and writing in the modern world been about how to evade the structures and conventions that impose meaning and yet remain meaningful?

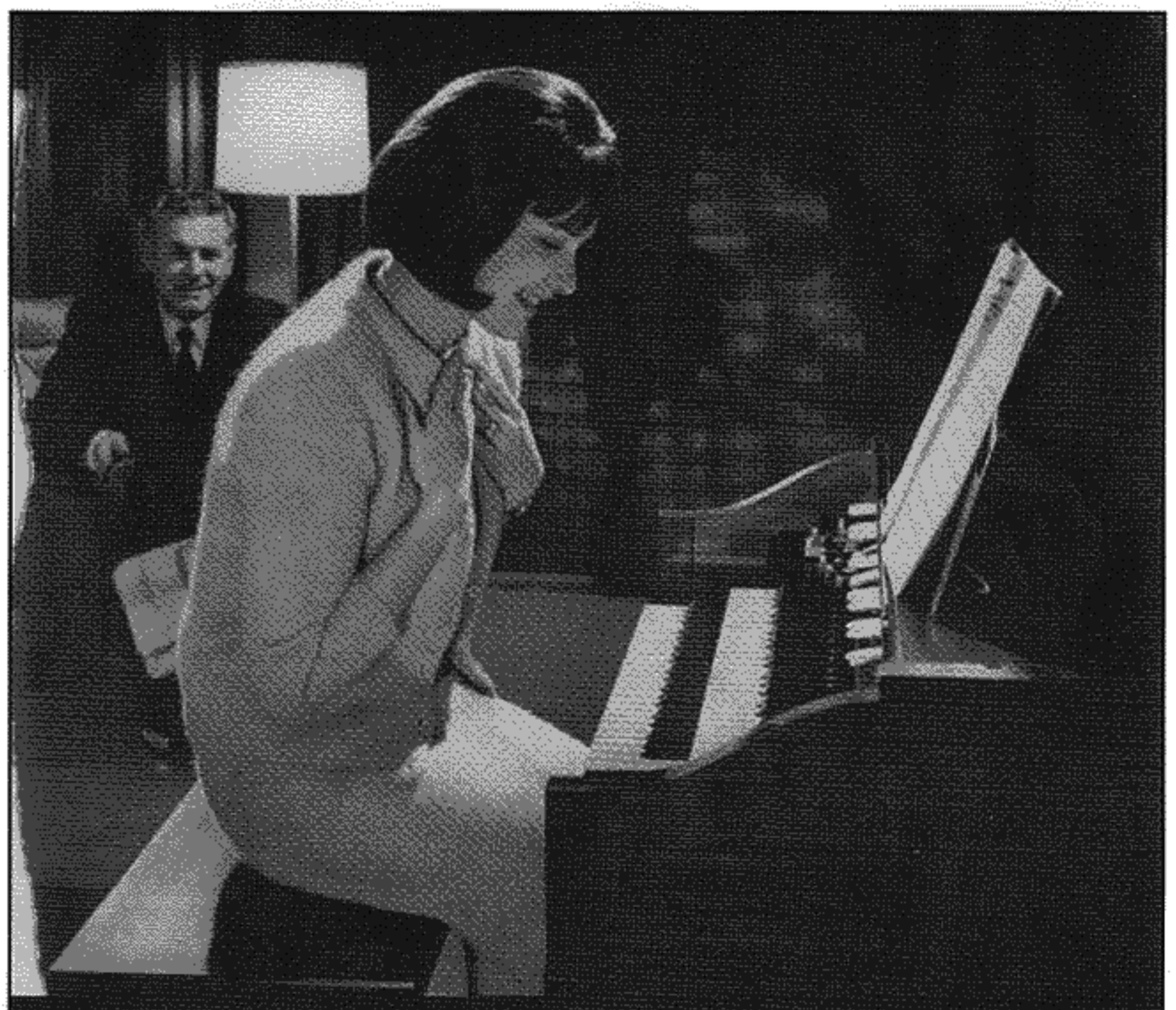
Feedback, or maybe just the idea of it, is one of the methods by which, in an age of very, very small machines and crystal-sharp images and sounds, people who wish to do so can create useful uncertainties about what is the right kind of attention to pay to something. That could be a good thing.





PENTOS FRAY BENTOS

Feedback at the Limits of Precise Control



"In the beginning there was feedback..." [1]

RECENTLY BUT CIRCUMSPECTLY A NUMBER OF CONCERT-GOERS HAVE voiced their concern to me that the sole interesting sound in an entire evening of improvisation was a sudden unexpected burst of feedback. Perhaps an inebriated saxophonist (their swollen ego dangling from the front of their instrument like some gross misshapen ball-bag) had blundered over a cable, thus enclosing a sensitive microphone with the bell of their horn. Maybe an over-enthusiastic sound engineer had tweaked the volume knob a notch too far.

Further to this, I myself have noted with propellant horror how the niminy-piminy audience that slaps its hands to its ears at the first shriek of howlaround during a modulated cello recital will, amazingly, not long afterwards pay good money to endure a two hour performance comprised only of intentionally generous feedback.

Clearly the desirability or otherwise of feedback is entirely contextual. To escape this earth bound referentiality, let us perform a simple "mind experiment".

Autopsy da Fe

"I was working in the lab late one night..." [2]

PULL ON A WHITE LAB COAT AND IMAGINE YOURSELF A COLOSSUS astride a vast scientific laboratory. From one sealed jar you deftly pull the gestalt of improvisation and toss it on the slab with a resounding 'bibba-bubba-shlongg' noise. Examine it, note the two discoloured roots extending from the wizened corpulent mass. One of these roots once connected to the thing that was jazz. Visible on the other (predominantly synthetic) root are all the signs that it has recently suckled nutriment from the cess of Electronica. Now, the nose test. There is indeed an olfactory component, a smell of gnarly brine mingled with old bags. Enough! Return it to the jar.

From the other sealed container you carefully remove the totality of feedback. Its corpus resembles an eerie baby, sleek but ill defined. Though feedback has suffered a long and difficult gestation, it is almost ready to face the world. But first we must inject it with some stem cells from the distressed improvisation gestalt. At the sight of the needle it throws open its crimson maw and begins to howl.

With a dead sound on the stroke of 99

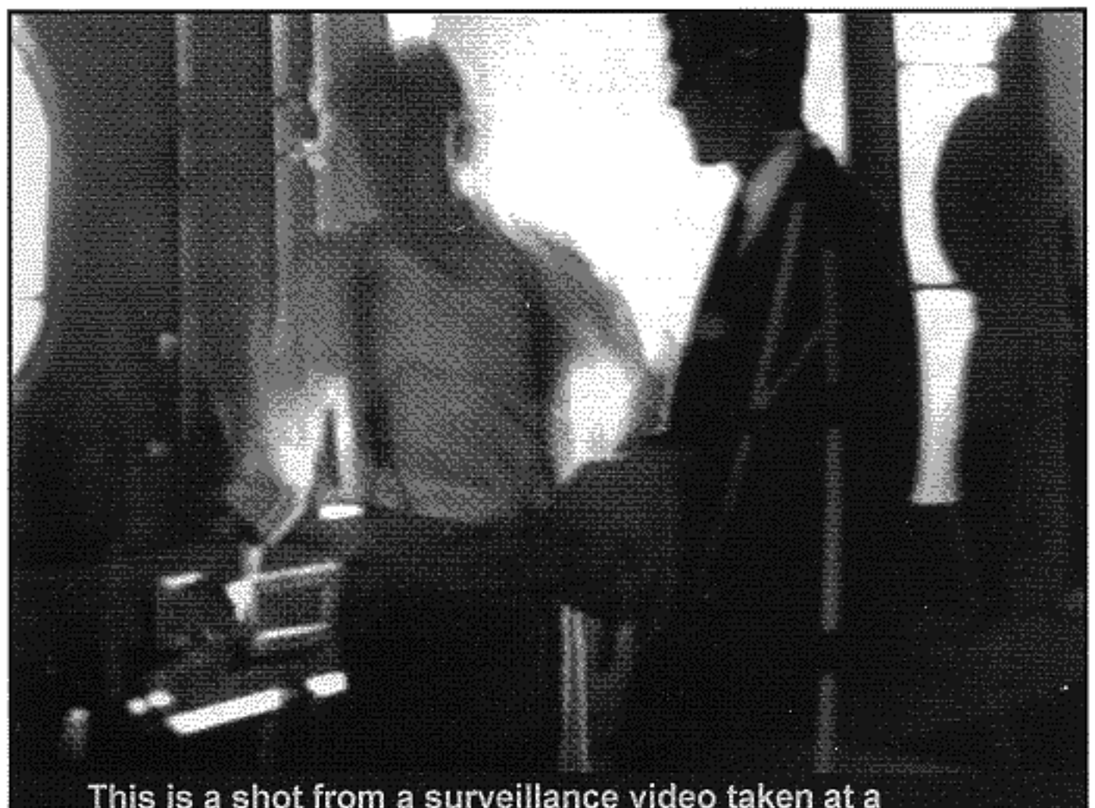
"(If they'd only) shut down operations, tipped their hats saying, 'We've done our thing, we're leaving the stage, we can't do any more', and shown that they aren't inscribed in history." [3]

WE MUST NOW TRAVEL A FEW YEARS BACK DOWN THE LINE. SITTING out a downpour in a fuliginous pub in a grotty seaside town, my eye wanders to a poster framed behind dusty cracked glass that occupies pride of place over the bar. It is an advertisement for a concert and for an unguarded instant I am convinced it holds a roll call of our most esteemed improvisers.

Startled, I look again. It is, in reality, a relic advertising a trad jazz jamboree featuring such hacks as Acker Bilk, Kenny Ball and Chris Barber. But the damage has been done. From that moment on a disturbing concept takes hold of my mentation - TRAD IMPROV !

Now don't get me wrong. There's nothing I enjoy more than a good Trad Improv spectacle. The double bass player spraying the strings with Mr. Sheen before thumping them with an Irving Welsh novel, the saxophonist parping like a Teletubby with amoebic dysentry, a credulous techno-bunny clacking away on a laptop and the inevitable drummer whirling a plastic tube over their head.

It's simply that it's all so - well, trad, dad!



This is a shot from a surveillance video taken at a meeting of instrumentalists. To try an cover their tracks they spoke in a secretive argot known as 'notation' and were heard repeatedly referring to a 'Big Score'.

There has long existed an unfortunate conceit that improvisation is somehow 'cutting edge', as though its practitioners should be rewarded with Pioneer badges for every bold foray into the unknown. But even in its raw form, improv is not an arbitrary system.

In the last quarter of the twentieth century improvisation came to be used by the majority of its practitioners as a way of managing the instabilities of new social conditions. In a grand social critique, they tried sidestepping the pervasiveness of commodity and production processes by concentrating only the liberating evidence of individual human productivity.

Here, the locus was the instrument through which rigorous technique, joyful exploration of sonic possibilities and an astonishing breadth of musical reference took place. But gradually that repository of possibilities, the instrument, became only the possibility of repositories. As in a cloud chamber where a fine vapour reveals the tracks of hitherto invisible particles, so our improvisers, as they pushed the envelope outward, mapped the prison bars and demarcations that circumscribed their original program.

Instrumentalists will undoubtedly always have worthy things to say, unfortunately the means open to them have been eroded by repetition, by the sheer exhaustion of their sonic palette.

But is there any evidence that feedback can provide that vital temporal legitimacy that has so obviously evaporated from the Land of Trad?

Into the ultimate labyrinth

MILLSTONES (*SIC*) IN THE HISTORY OF FEEDBACK:

1847 Gustav R. Kirchhoff's famous paper on electrical networks. One point brought to light is the importance of 'meshes' or closed circuits. A more descriptive term is 'loops'.

1928 Harold S. Black attempts to patent negative feedback and is laughed out of the office. 'Our application was treated in the same manner as one for a perpetual-motion machine'.

1932 *Reflexions Sur La Science Des Machines* by Jaques Lafitte. In it he argues that a science of machines demands a unique place in the ranks of scientific disciplines.

1948 Publication of Norbert Wiener's *Cybernetics, Or Control And Communication In The Animal And The Machine.*

1959 Karlheinz Stockhausen employs feedback loops as part of his procedure for constructing timbres for *Kontakte.*

1966 Live performance of *I of IV* by Pauline Oliveros, a solo tape piece utilizing double feedback.

RAP! RAP! RAP!

Judge Knotye: Would the learned counsel for feedback care to let us know where he is leading us with this tedious recitation?

Defendant: M'Lud, I am seeking to reveal how the contemporary improviser, having rationalised the cultural redundancy inherent in the current range of acoustic and electrified instruments, is turning to feedback as the means of sonic salvation.

Judge Knotye: Very well, but keep it brief.

Defendant: The central issue here is one of control. The extreme amounts of control required in order to precisely master conventional instruments is no longer considered pertinent, or indeed, acceptable. The utilization of feedback implies a rewiring of the control relationship between improviser and sound generating apparatus.

Creep: Objection! The human/instrument relationship is one sanctified by centuries of —

Judge Knotye: Objection overruled. Get on with it.

Defendant: Thank you, M'Lud. Once initiated, feedback devices are often capable of functioning without human intervention. Human agency can be relegated to a subsidiary and incidental level. Members of the jury, you must be clear in your minds that such an interaction is above all a political choice.

Judge Knotye: And exactly what does the learned counsel propose that we should call these 'feedbacking devices'.

Defendant: Let them be known as UNSTRUMENTS!

The Coming Of The Unstruments

"Mister Writer Person, I have undertaken this long journey purposely to see your person, and to know by what engine of wit or ingenuity you came first to think of this most excellent help in feedback, viz. The Unstrument; but, Mister Writer Person, being by you so found out, I wonder nobody found it out before, when now known it is so easy." [4]

I'M NOT GOING TO CLAIM THAT THERE'S anything remotely novel in the concept of Unstruments. Their emergence is perhaps only another case of that process whereby tiny discontinuities multiply, gradually cluster together and a particular phenomenon becomes suddenly visible and aquires significance.

Or might it be that events surrounding our furtive phenomenon moves on and that once perfect camouflage no longer serves to conceal. Regardless, in the words of the creepy little blond girl from the film *Poltergeist:* 'They're here!'

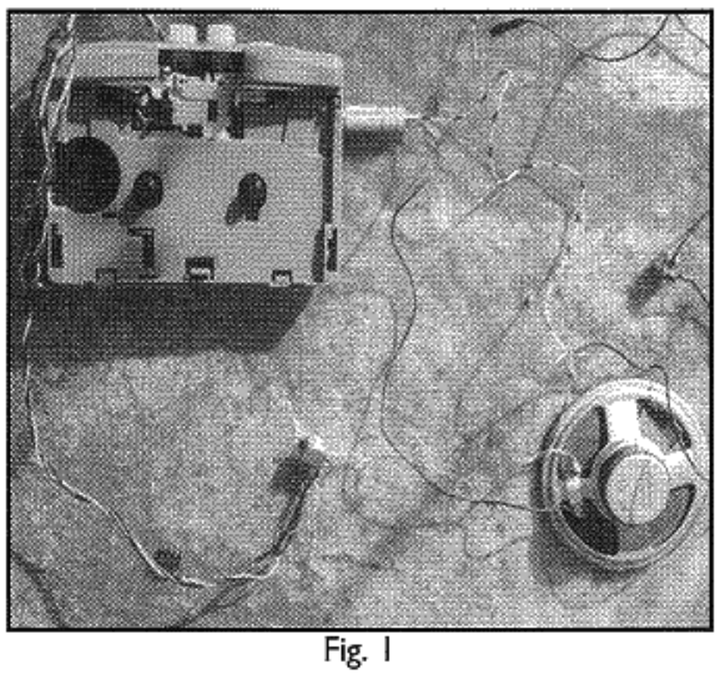


Fig. 1

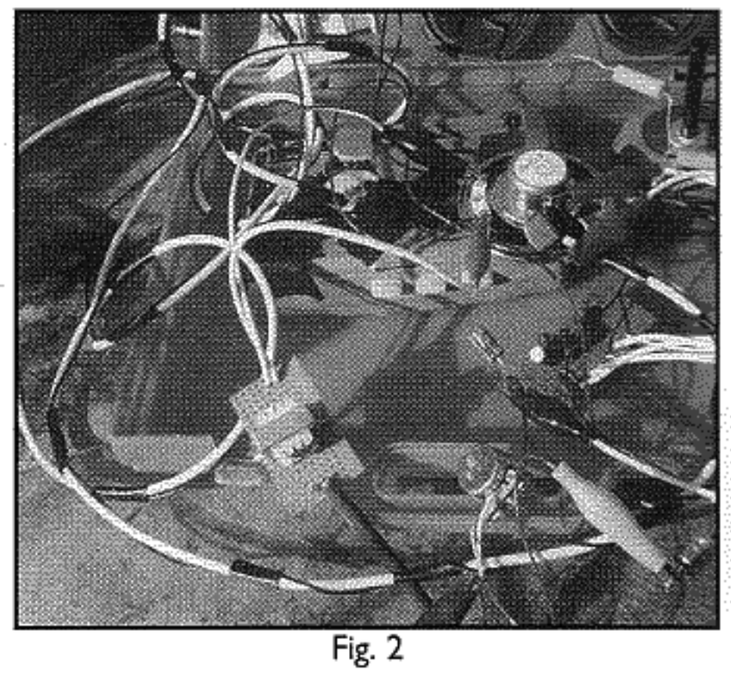


Fig. 2

Unstruments are a form of sonic Lego. The starting point is a 'feedback element' — which could be a simple oscillator or something more complex — to which electronic components are spontaneously added. Here are some of their characteristics :

☛ pitch, duration, timbre (those beloved constituents of muzak) tend towards the uncontrollable;

☛ once set in motion, it is likely that the unstrument will continue to generate noise;

☛ they are multinodal facilitating a multiplicity of possible connections;

☛ circuit design is improvised and sometimes self-destructive;

☛ sudden changes of state occur (instability) and all manner of interference is picked up and passed on;

☛ they are only minimally 'hardwired' — unlike conventional electronic instruments — and successfully evade the cloying supremacy of computer modelling;

☛ construction and performance are co-temporal;

☛ they must be disassembled immediately after usage;

☛ their sweet DIY nature renders them robustly anti-recuperative.

For those readers of an adventurous nature, I now offer an example of 'How to build a feedback element for little or no money'.

Take one broken-down cassette Walkman (see Fig.1). Bust it open, detatch the tape head and unsolder the three connecting wires. Using longer bits of wire, reconnect the head to the original three wires so that it is remote. Attach a minijack plug to an unenclosed speaker (you'll always find one you can rip out of a broken or brand new television) and plug it into the Walkman headphone output. Next, bring the tape head into the proximity of the speaker magnet — et voila!

Provided you can remember to hook up the batteries and connect hundreds of additional components (see Fig. 2), your Unstruments should provide decades of fun — despite their eventual complexity and inescapable ephemerality. Go Excrete.

Botanizing on the feedback

"Who's going to know
That you've been feeding back
A hundred years from now?" [5]

A QUICK PEEP BENEATH THE TATTY CARPET OF fragmentary discourse will reveal that, despite appearances, reality is being increasingly hardwired. This economy of options is reflected in the electronic world, economies of scale have driven the discrete transistorized circuit onto the museum shelf and replaced it with the VLSI (very large scale integration) chip, in effect the encapsulation of vast circuits into a single component.

There's no way that feedback can help us facilitate an escape from expanding restriction, but it does allow all of us to comment on our hapless predicament in any number of enjoyable ways. However, hearken to the words of a typical media hack: 'It is unlikely that feedback will form the basis of a programme which will seek to tell the story of the years of the reign of Queen Elizabeth II.' How can you argue with such an idiotic opinion?

But just what will the feedback of all our tomorrows be like? Will it distil into the philtre of the future? Or will instrumentalists and musicians still be demanding a return to the armchair days of the antique lug-tuned banjo? Will the old gits be whining, "Nurse, nurse, stick that bleedin' *Metal Machine Music* on again before you hand out the medication"?

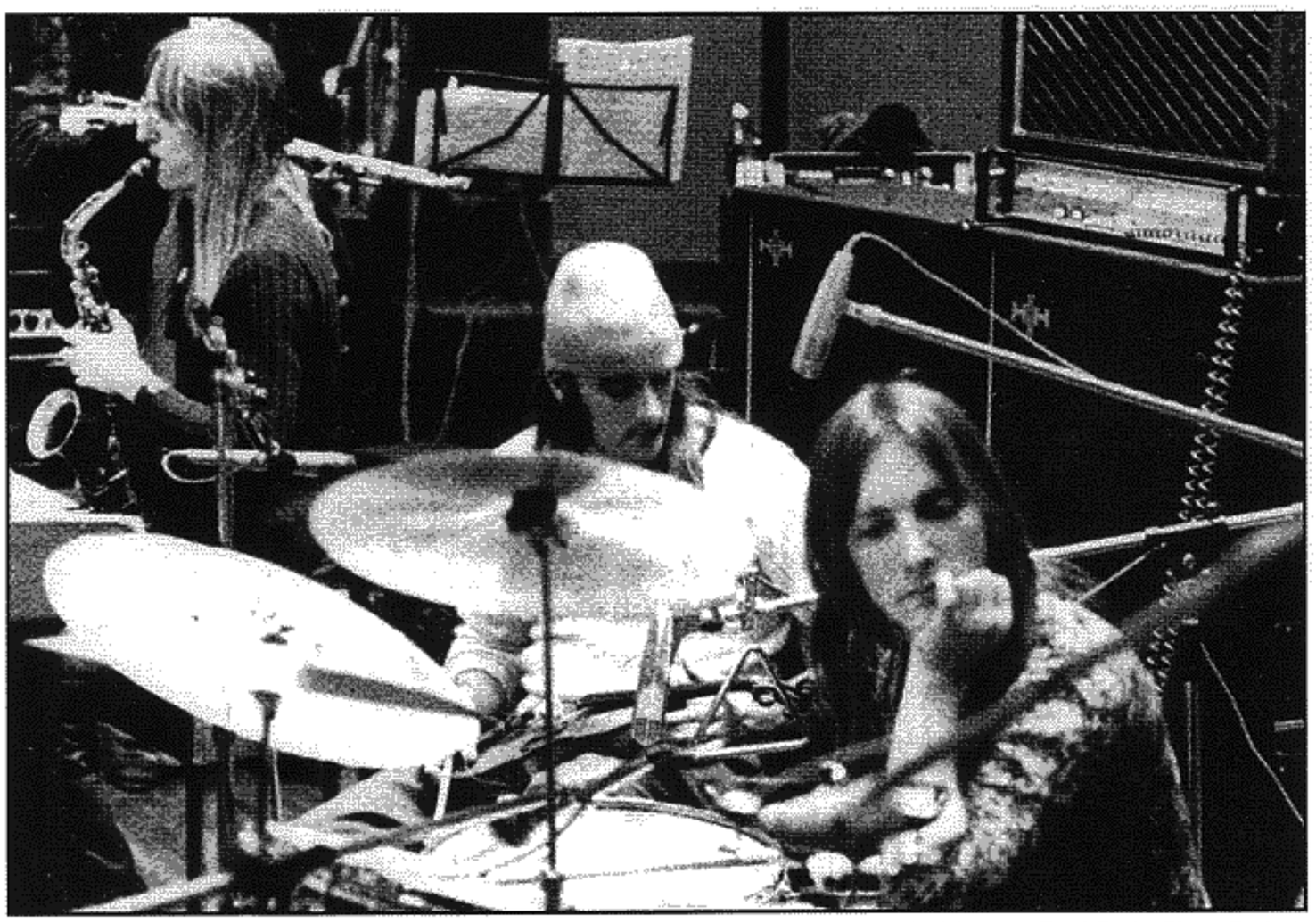
As a vision of what will come to be I can offer you only this -

IN THE BEGINNING THERE WAS FEEDBACK.

Notes:

1. Lepke Buchwater, *The Psychopathology Of Improvisation,* unpublished writings.
2. Bobby Pickett, *The Monster Mash.*
3. Paul Virilio, *Pure War,* Semiotext(e) 1983.
4. Letter from Boz Scaggs to the author, 1992.
5. Gabby Yorath & Wendi Deng, *One Hundred Years of Feedback.*

Record Reviews



Henry Cow (*l to r* Tim Hodgkinson, Fred Frith, Chris Cutler)

Henry Cow
Western Culture
ReR HC4

What a title for an album! The picture on the back features people who've obviously eaten a lot of beefburgers waving bank-notes with 'culture' printed on them. So you'd expect this to be pretty lapidary. When in fact it seems transitional. Not just in the sense of 'on the move' but also in the sense of 'not sure where it's going': a bit content to lay out its wares, to spread out before us the richness of its acrobatics.

There seems to be a good deal of trying out of instrumentations, which tends to be decorative where the composition hasn't integrated sound colour into its process. Perhaps some of the simpler certainties that animated the group's earlier work are no longer in place. There's a key absence: that of Dagmar Krause, the war-angel of the group's texts, the tactile surface of the group's anger - an absence that perhaps forced the group to think its music more abstractly. But all this is contextual remark: time passes, the group fades and the music has to stand on its own.

So what is it like to listen to? Well, there's a great deal of inventiveness and so on but somehow I am forced to assemble good things to say about this, rather than being seized by its central point. I believe in fact that it doesn't have a central point.

The nadir for me is the heavy Pink Floyd-type texture beginning the seventh piece, 'Half the Sky,' leading into a swimming chord-pool with ghastly optimistic harmonies utterly unredeemed by a soprano sax wittering over the top. (This is the only piece, incidentally, for which both composers on this album are responsible.) But the real problem of the album isn't an accumulation of style crimes so much as the undoing of its strengths by recurrent structural weaknesses. So in the first piece, 'Industry', a slow logic is unafraid to take its time; reaching a stronger statement, it backs down to start the next phase... unfussy and deliberate, the cymbal marking the accents with a compressed-sounding whoosh. But then a big riff is brought in and suddenly crude repetition flattens and undoes the balanced asymmetries of the earlier sections.

Again, in the second piece, 'The Decay of Cities', the clearly sculpted-out lines of the opening minutes get blown away by a burst of Stravinskian fragmented ostinati, at once more elaborate and less essential. This might have been redeemed by the following section, which leans towards a possible future in which dynamics and texture become the main variables used in the structure; or in the final part, with its aridly high voicings of unresolved harmonies and its ritual 'undoing' of the Spanish guitar heard at the opening of the piece. But confusion isn't redemption.

Where compositional identity is consistently maintained the music is simpler and more evocative, as in the third piece, 'On the Raft', a kind of big buttery brass dirge, in organisation a bit like one of those Messiaen pieces that are actually just chord sequences, the melody of chords alone (reminding me at moments of a Takemitsu piece for brass perhaps written around the same time and probably called 'Rain in the Garden' or some such). And in the sixth piece, 'Look Back,' which is a brief and pure evocative moment.

This group is one that stayed on the move. And that has a cost. My verdict on this particular recording (first released as an LP in 1978, then as a CD in 1988 on Broadcast Records) is that it shows technique and versatility but that its project is compromised. It documents a phase where the composers were, for better or for worse, forced to rethink but without grasping what was involved or going far enough. What needed to be done was probably to musicalise whatever had until then been concretised in a cluster of personal social and political circumstances that was now falling apart.

By 'musicalise' I mean to draw into the core of the composition process, the actual work of making the bits of art. By 'cluster of circumstances' I mean things like the willingness of individuals up to a certain point to sink their differences into a shared project, to give without getting hard answers back, and also things like the zeitgeist, the political and cultural atmosphere of the late '60s to '70s. And of course we as listeners are also outside of that cluster of circumstances, and that perhaps makes this more naked to us.

I think what I hear on this album is that the composers know how to set themselves limits, but don't know how to trust in them and see them through to the end. They get tired (or are perhaps pressured for time) and the thing that they used to be able to fall back on is no longer there. At these moments you can sense them reaching for what the group thinks it does best - *i.e.* playing tricky time signatures in that kind of military Stravinskian rhythm once held to be the mark of authentically progressive music - instead of trying harder to solve the problem of the composition itself at all costs and then forcing the group to play it.

This is the kind of compromise that becomes more audible over time as the context fades away. We hear the constructedness and lose the inside thread.

TIM HODGKINSON

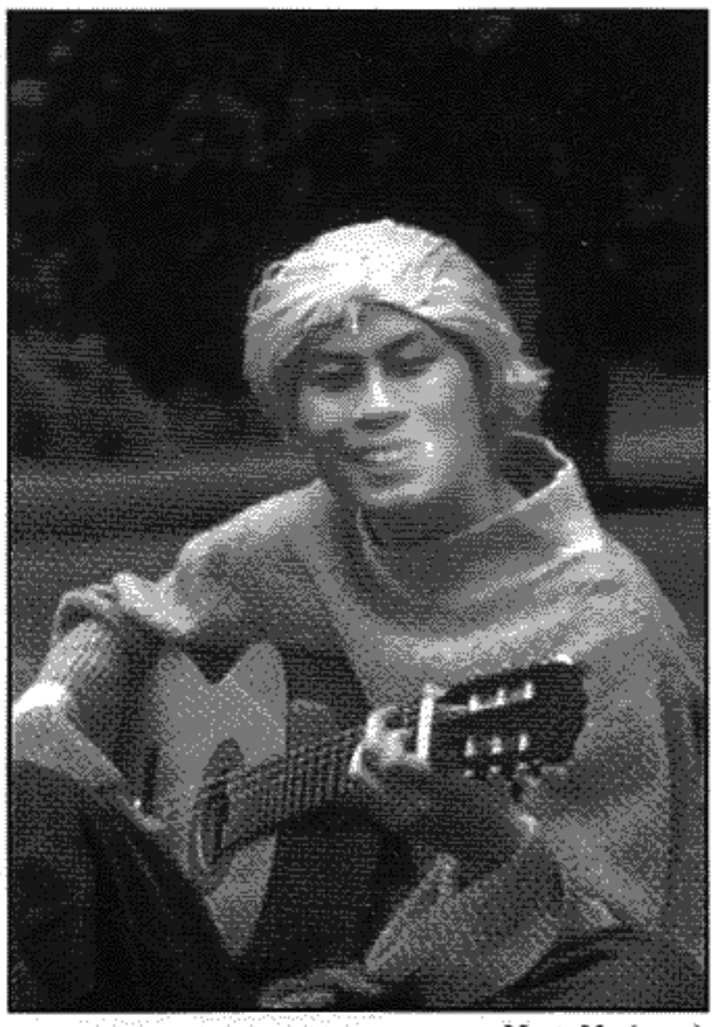
Toshimaru Nakamura & Sachiko M.
do
Erstwhile 013

ANOTHER WINNER FROM ERSTWHILE, NOW delving into the increasingly visible world of *onkyo*. Toshimaru and Sachiko play respectively a mixing desk with no inputs and a sampler with no memory, creating a music whose basic elements are looped clicks and glitches combined with sine wave drones. This might sound like familiar electronica territory, but the aesthetic is unequivocally improvisational, whether evolving textures over a 35-minute session (*track 1*) or producing concise, witty instrumental dialogues (*track 2*). The fact that these are all live concert recordings adds to the sense of immediacy. What

makes it radically different from anything else I know of is the combination of an extremely self-effacing delicacy (it's easy to see where the cliches about Zen in discussions of this music come from) with the frequently head-scrambling intensity of the sounds. These drones aren't a means to altered or purified musical experience, as in American minimalism, say, but simply a raw material with the same validity as any other.

This gives the music an almost dystopian edge, as if emerging from a future where the most uncompromisingly machine-like sounds have been seamlessly absorbed into human life; and, like many a sci-fi vision of things to come, it manages to combine a sense of hygienic effortlessness with an undertow of menace.

THEO LORENC



Xper.Xr (anon)

Xper.Xr.

'Because I'm Worth It'!

CHAB018

XPER.XR. FIRST CAME TO OUR ATTENTION with the *Golden Wonder* CD and the 40 minute opening track's onslaught of noise collage and mutated techno. Then came an apparent about-turn with *I Love Music* and *LunHsiaoShua* which must have alienated his earlier fans. Gone was the safety of *noise* — Xper.Xr. had apparently gone soft. *I Love Music* was a delicious and hilarious teen bedroom pop-fantasy complete with stadium-rock artifice. With *LunHsiaoShua,* however, things had moved on again and we were presented with a seemingly ramshackle album that I, for one, initially found difficult to know how to approach. However, repeated exposure slowly revealed its mad method and the ideas that lay beneath the surface. I realised that the key to listening to these albums was to approach them as the products of a work of fiction — Xper.Xr himself. These CDs fulfil one of my main criteria for successful music or sound art — they create (or leave) space for my imagination.

'Because I'm Worth It'!, his 4th CD available in the UK, is a hi-fidelity Xper.Xr. release — it sounds fantastic. Don't let that put you off though: it just better reveals the loving attention to detail and the continuing development of the ideas and soundcraft behind the Xper.Xr project.

A central method of this project (dating right back to the 'noise' CD *Golden Wonder*) has been the use of the karaoke phenomenon as an expressive tool. This method, maybe first encountered in the infantile-anal antics of The Hanatarashi, has been developed into an artform by Xper.Xr. and for me represents a paradigm shift in the (previously cold) area of plunderphonics. There is no ironic distancing through the cut-up, fold-in and glitch methods — taking small parts and building them into some new (and usually dead, from the neck down) pomo-ironic composition.

Neither is there the use of sound quote for the easy and tiresome 'humorous effect' that has previously marred some work in this area. Xper.Xr's approach is to lift the original (sometimes lock, stock and barrel) and then subvert it through the filter of the self, modifying it by using a kind of aural graffiti.

This may sound simple but Xper.Xr has learned how to do it with exquisite judgement. The effect is to re-negotiate a relationship with the perfect pop-music product through a personal-isation of the original material. That is why this work is alive and full of genuine warmth and humour.

I have to say that there are one or two places that Xper.Xr maybe goes too far — for example, presenting us with over eight minutes of 'J'en ai MAL de tout' (a radically slowed down and acoustic reworking of another song by someone else).These occasional indulgences can be easily forgiven, though. They are partly due to the risks associated with the nature of the project and shouldn't be allowed to detract from the work as a whole.

There are still lots of great reasons to enjoy 'Because I'm Worth It'!. For example, the tucks and folds in the fabric of 'Hak Gua Dik'; the sound of a well-known pop CD having been left playing constantly in the background (a lovely piece of *mise en scène*); the integration of the earlier (Golden Wonder) 'little death machine' Xper. Xr. with the karaoke Xper.Xr; more great super-indulgence on the electric guitar from the maestro himself and absolutely great tunes. Brilliant. Don't talk, just listen.

SIMON LUCAS

Axel Dorner

Trumpet

A Bruit Secret 03

AXEL DORNER HAS BEEN ONE OF THE MOST important and influential musicians on the improvisation scene over the last six years. He is one of the principal players associated with 'Berlin near silence' music and a member of one of the best improvisation groups, Toot (with Phil Minton and Thomas Lehn). Some *Resonance* readers will remember his excellent (acoustic) solo performance at the Queen Elizabeth Hall for the LMC Festival in 1997. Until recently there have been few opportunities to hear his work on CD.

When Dorner plays, elements and events are contrasted and combined to create his music. Nowhere on this CD does a conventional trumpet note appear. Instead, we hear a vast array of filtered noise shapes, purrs and growls. Dorner's use of tension and release is masterful. Gradually, the listener begins to feel comfortable within his sound world, only to have this comfort shaken, sometimes by silence, other times by changes in material or dynamic shifts. These changes always surprise, because you begin not to expect them.

The CD sounds as if it was recorded using close microphone techniques. This gives a sense that the listener is hearing what Dorner hears himself as he plays. It is almost as though we are inside the trumpet. The minutest detail of textures can be heard, textures which are sometimes bare and skeletal, or rich with overtones and inner movement.

Track 1 is an unbroken 21 minutes of white/coloured noise, filtered and pinched to accentuate the overtone content. The track moves slowly, using only a narrow range of pitch changes. From being wrapped in a blanket of textured noise, the end, then, is shocking. The listener is abandoned to the sounds of the outside world. On *Track 2*, Dorner uses an array of trumpet sounds which are grouped together to form irregular, rhythmic episodes. Silence is used skilfully to propel the music forward. Sometimes there are only two or three sounds at a time, sometimes the sound is more sustained, rich in both foreground and background detail. The sense of time passing becomes blurred. As with the end of *Track 1*, having become accustomed to this sound world, the listener feels a sense of shock in the realisation that the playing has stopped. This is a very important release and is thoroughly recommended.

PHIL DURRANT

Bing Selfish & the Ideals

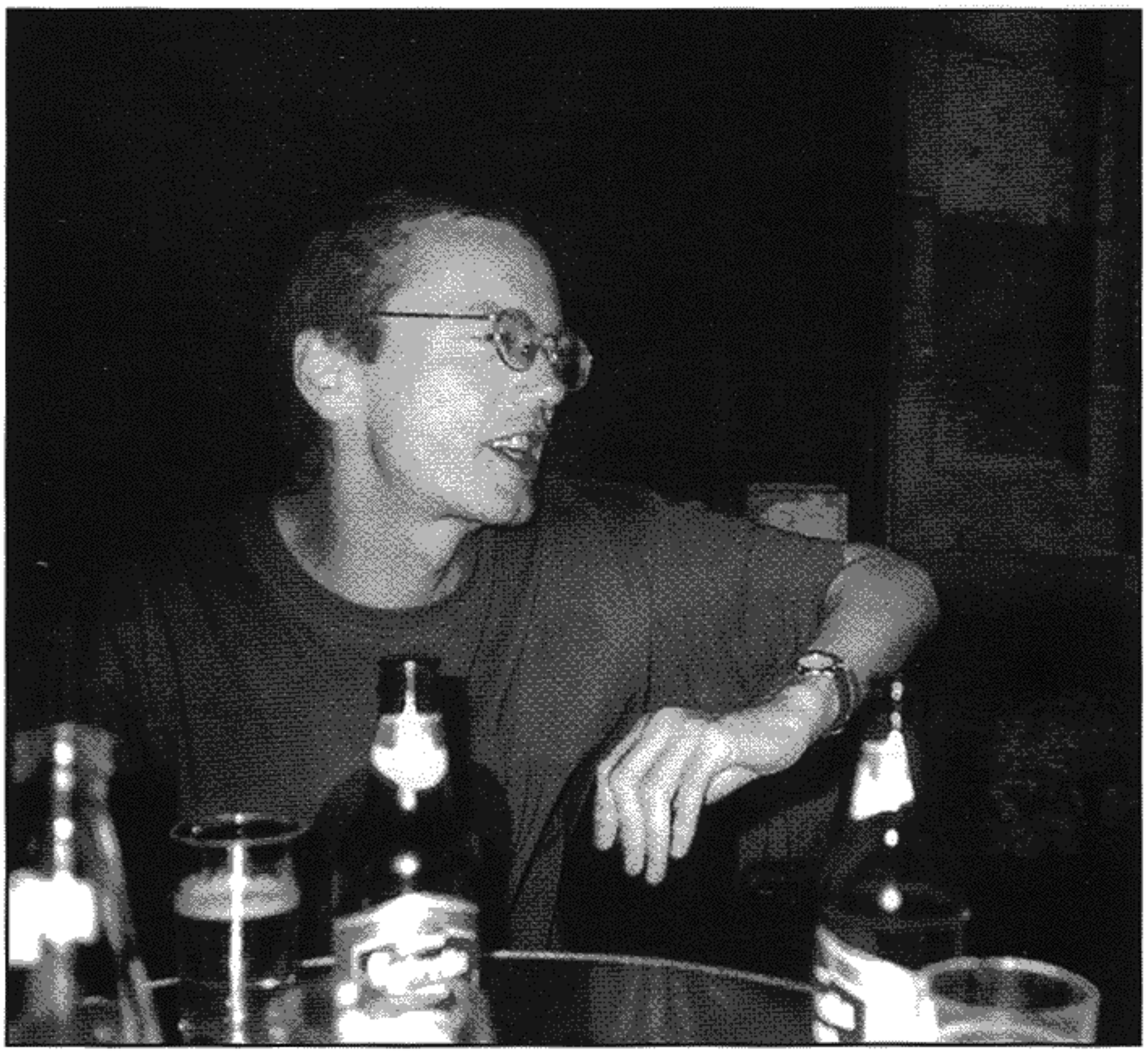
Dizzy With Success

Alcohol ALBS1CD

BING IS CLASS-CONSCIOUS AND SKIS WELL. (1) And this recording, like its predecessors, follows suit. And speaking of suits, Bing, the red-diaper baby, has inherited the late Phil Ochs's wardrobe. By which I mean that as with early Ochs there is an exact fit, bordering on isomorphism, between a song's concept and its execution; a total grasp of quite meticulously defined micro-genres; the difference between off-the-peg and made to measure. A given line might refer to as un-poppy a topic as the murder of a left-revolutionary leader, but would be, playing it more straight, followed by a chorus: 'It's a story of love, it's a story of hate / It's a story of chance, it's a story of fate', which catches as adroitly as a 3-minute pop song can the political debate about the nature of history — personal or political.

So why might readers of *Resonance* be interested in these imperfect pop-songs? (which all share one thing — an immediate recognisability for what they are stylistically, even if one can't always name what the micro-genre is...(2)). What holds the attention is the perfect poise, which extends way beyond the CD booklet photos. But the poise ought to be wobbling, even though it isn't. All Bing's songs operate exactly on an impossibly narrow line between conviction and spoof. There is an exact refusal of certainty, the tone an unprecedented fusion of Douanier and Jean-Jacques Rousseau. Which is not to say that the music is naive (though it is, if not actually listened to); nor is it to say that it is faux-naif either. Others have paddled in this particular pool too — Coxhill and Beresford come to mind — but only Bing is left sunning himself beside it afterwards. Certainly the late Ochs never managed it.

The absolute appropriateness of the playing is crucial; the exactly right but wrong horn lines in 'Loneliness' come to mind. Had they sampled James Brown directly, the song would topple one way into the world of commerce; but had the live playing been exact quotation (*à la* Zorn) it would have driven us into the Forest of the Avant-Garde. A gently reined-in not-quite-rightness that does the right job — in Monk's terms, all the right wrong notes, but wrong in execution not pitch — is precisely calculated and it is over in seconds. The lyrics work as meticulously as the music does: 'Sechuan' has a couplet — 'Birds hover over towering cliffs / as villagers build massive spliffs' — which reveals a fondness for Penguin Classics chinoiserie and takes the piss out of it,



Bing Selfish (Daniela Gargiulo)

(almost) simultaneously. The delay just gives time for any joke to sink in before the change of direction, wholly masked by music which continues in a straight line past these swerves, as if oblivious. 'I don't always walk a straight line', Bing sings. His bifocal enthusiasm is just that; it is important to say that Bing is not a PostModernist. Similar bobbing and weaving — not formulaic, just playing with formulae — happens throughout every song. This would be exhausting, if the surface style wasn't trying hard to persuade you not to pay proper attention (a faux-pas in some musics!). So how to sum this irreconcilable division? A final conclusion is impossible; but clearly Bing Selfish recordings are the only oeuvre that truly warrants the term 'Loungecore'; and as such can be both recommended and not, with equal fervour.

HARRY GILONIS

1. A quotation from the Chinese Revolutionary 'opera' *Taking Tiger Mountain By Strategy*, which exactly catches the binary nature of Bing Selfish's worldview.

2. A trait *Dizzy With Success* shares with Dylan's *Love And Theft*; Bing remarked in an interview that 'Bob is a very warm human being'.

Charlemagne Palestine

Continuous Sound Forms

Alga Marghen 14NMN.036

THIS SECOND CD IN ALGA MARGHEN'S 'Golden Research' series brings two more Palestine pieces into circulation. The first, 'Duo Strumming For Two Harpsichords,' can be usefully compared to a contemporaneous Ligeti composition for harpsichord — 'Continuum' (1968), a much shorter and instantly intensifying piece where the timbre of the harpsichord is emphasised by the way the work ends — with a rapidly strummed single note. Palestine, on the other hand, seems much more interested in having intensity accrue from elongating planes of harpsichord sound that decentre the listener, simultaneously offering an overarching duration with moments of foregrounded phase-shifting. The sense of 'progression' audible in Ligeti's piece can here be contrasted to a kind of static-movement, a deepening of the moment, an affecting use of repetition that could be said to open up what Felix Guattari has called 'existential territories'.

The second piece on this CD, 'Piano Drone,' has the similar effect of restricting the range of notes we hear but this time, rather than losing a sense of where we are within a melody, the restricted range enables Palestine to intensify the attack of the playing so that it creates a kind of shadow track – the physicality of the playing not only creates the drone of the piece's title, but presents an emotional concentration that manages to surpass the often dryly formal concerns of 'minimalism'. In this way Palestine is not so much a 'minimalist' who awaits his canonisation; but one responsible, by means of an experimental insistence, for the subtlest of still reverberating paradigm shifts.

HOWARD SLATER

Charaoui/Lely/Wright
396
Matchless Recordings MRCD42
YANN CHARAOUI, JOHN LELY AND SEYMOUR Wright all make their recording debuts here. They are young, and, as Eddie Prevost's liner note has it, untested in terms of been-around-the-block playing experience. But the drafted-in instruments and playing methods in use suggest that the idea of the test and the testing process itself is central to these players' approaches. Alto saxophonist Wright seems to want to strip his horn of style, and his complete avoidance of musical gesture and context renders free of history his New Orleans slaps, growls and screams. Charaoui clatters around with cymbals, playing in the moment; and with tabletop samplers, replaying and manipulating the group's earlier moments: he re-writes the performance as it unfolds. Lely's Indian bal-bal tarang rattles like a National Steel guitar and bows like a cello, while his prepared piano chords clank like Tilbury in the kitchen.

The group create a soundworld of metal and glass, a sharp but fragile network of fragmented attacks, free of instrumental language. In the comparative absence of idioms or roles, it is sometimes hard to hear who is doing what. And it is not just the players' identities that rotate around the trio: musical parameters are also swapped about. Wright's slap-tongued ostinatos and key-clicked loops press pitch into service as rhythm and Charaoui's minutely inflected cymbals vice versa. The group's formal strategies are impressively varied. The planar is overlaid with explosive outbursts, often from Charaoui; the trio moves in and out of density and volume in concert; the players duet, solo, or all sit silently. Such versatility gives each track a distinctive array of formal shapes, the first rapid-fire, the third exploring static loops and drones, and the fourth forlorn and pointillist. The players' stamina only fails on the second track, as might that of the listener: twenty minutes too much music in an otherwise beautifully compact statement of intent.
TOM PERCHARD

Peter Cusack
Your Favourite London Sounds
RES FLS1 CD
THESE ARE THE SOUNDS OF THE psychogeographer's derive around London as Cage might have experienced. (Talking of whom, I once bumped into John Cage on a London street near Covent Garden — talk about chance!) Here are some of our favourite sounds, selected by Peter Cusack from suggestions by hundreds of people. None of the suggestions, curiously, were identical: to each Londoner his or her own unique favourite London sound, down to the specific bus number. All these sounds are so familiar and form part of one's own personal soundscape, sounds that we experience every day but don't always hear. I probably listen to the same birds that Peter listens to and fry my onions from the same shop. He lives two streets away from me and yea, I have merrily dinged (or should that read dung?) the bell on the 73 - lovely. Listen also to Brixton station and marvel at the clanjamfrie of sound, musique concrete. Hear the polyphony of squeaky barges, police sirens and the hum of a plane, then ride your bike back and forward over the towpath's loose flags and just listen.

Cusack is the new Cage, forcing us to pay attention to the music of our immediate environment, and how much better a lot of it sounds than much of the shite that passes for latter day electronic music. Dave Mandl's accompanying photos offer an oblique outsider's view of the lesser known backsides of London, in an architectural sense. They work with the same impact as the sounds and cause you to look or hear where you wouldn't normally. One regret - a recording of a Leyton Orient goal would have been a precious pleasure, which for some of us would have merited repeated playing, given its rarity.

The beauty of this record now is that given the recent sudden drop off in the tourist business, people can buy this all over the place and hear what London sounds like, without having to leave their abodes.

You just hope for Charles Hayward's sake that this CD doesn't become a hit, and that loads of people don't start traipsing to the Deptford Grid Power Station hideaway where he's been hanging out for the last 21 years, sad bastard. Does it hum because it doesn't know the words?
IVOR KALLIN

Michael Prime
Elements I
Mycophile SPOR 06
ELEMENTS I CONSISTS OF TWO PIECES, 'Surface Tension' and 'Salamander,' the sound sources of which are water and fire respectively. Far from merely being studies of these sound sources, the pieces reflect a strong concern with narrative while simultaneously evoking large-scale environments. The sound materials used in 'Surface Tension' (*i.e.* the source sound and its subsequent transformations) are fairly homogeneous and their vocabulary limited. Yet although easily grouped by spectral, spatial and motion similarities, they underpin the work and provide it with a solid structural coherence. Throughout the 21 minutes of 'Surface Tension', Prime succeeds in holding our attention by way of careful event-pacing and fluctuation of event densities, combined with well timed movements between external and internal worlds, distant and intimate sound environments.

'Salamander' is similar in pace to 'Surface Tension'. Prime juxtaposes its sound source with transformations that are softer, less bright and less volatile than the arresting crackle of recorded fire. Again concepts of intimacy and distance are very strong, and the composer creates a vital and interesting discourse which mediates the two.

Crucial to both pieces is that rather than implying a sense of climax by simply increasing the density of layers within the mix, Prime allows his chosen material its own space and time, within which it may either simply exist or organically evolve — thus moving from what would appear to be highly structured composition and real-time processing to a fluid aural experience which repays repeated listening.
SIMON VINCENT

BARK!
Swing
Matchless MRCD41
BARK! IS THE TRIO OF REX CASSWELL (guitar), Phillip Marks (percussion) and Paul Obermayer (electronics). Their music is hard-edged (emphasized here by a crisp studio production), nervous improvisation, held together by an oblique textural logic and resolutely un-groovy rhythmic figures: compared to Konk Pack, who work with similar instrumentation, there's less of a tendency to full-on noise white-outs, and a comparatively indulgent attitude towards the exploration of marginal sonic terrains. Obermayer bridges the gap between Marks' skittering drum work and Caswell's heavily overdriven scrapings and twangings, combining abstract metallic chirps with brief, dissonant chordal interjections, and leavening the whole with unexpected orchestral samples. With its stop-start dynamic and dry sound-world, this record certainly doesn't yield its sonic pleasures to the casual listener - indeed, when BARK! slow down and try to explore more extended textural improv, as on 'Vela', the loss of momentum tends to lead to a certain directionlessness - but there's a wealth of ideas, and an intuitive sense of structure which only emerges with repeated listening. It's unusual, inventive, and definitely worth persisting with.
THEO LORENC

Sylvia Hallett
White Fog
Emanem 4057
AS A PRINCIPLE ORGANISING FORCE IN LMC'S 1980s Gloucester Avenue space, Sylvia Hallett always represented the 'broad church' school of the organisation. Though her performances have often taken the form of pure solo improvisations she has chosen not to represent these on record and her solo albums to date contain her more-or-less composed works for theatre and dance. The bulk of this new album is taken up with a suite of pieces performed on bowed bicycle wheel, voice and electronic processing. The opening cries of a softly bowed spoke bathed in cavernous echo delimit a haunting, magical space and a soundworld that lies somewhere between those of :zoviet*france: and Pauline Oliveros. Grotesque phantasms appear with the introduction of live electronic processing, though some of the undisguised use of pitch-shifting elsewhere suggests this device is rather a crude one. The lyrical themes are bleak. The title piece depicts psychological withdrawal, an unreachable retreat from the world, while 'Private War' deals with the petty behavioural patterns that can threaten to bring down relationships. It feels like Hallett has let us into a very private space and it's not always a comfortable place to be. Hallett moves to her first instrument, the violin, for the album's centrepiece, an acoustic improvisation recorded at home. While the violin is a much more precise instrument than the bowed spoke, it's the intervals and ambiguities that Hallett remains concerned with, and the piece has a convincing arch and complexity.

The album ends on a welcome upbeat with a tape collage of field recordings and original music played on electronic keyboards - a sophisticated production, particularly when compared to the simple means employed on the previous tracks. This piece, 'Snail and Curlew,' was written for a dance film set in the Lake District and resolves this challengingly direct album by evoking the potential for redemption and reconciliation which nature affords.
PHIL ENGLAND

Mike Cooper
Globe Notes: Seven Songs Of Place
Hipshot HIP 007
THE ANALOGY BETWEEN THE PAINTING HUNG on your wall and certain ambient music seems straightforward enough. The way the music just hangs there, not demanding that you focus on it, but available for close inspection when you're ready. 'Wallpaper music' is still used as a term of hearty abuse by those who presumably pride themselves on practising a robust, old school type of listening; a no-nonsense, crisp, manly focus on the matter in hand. All the same, the evolution of Ambient has enabled many musicians to pose questions about the shifting relationship between music and environment. Mike Cooper's take on the subject draws on his background in free music, low-tech electronica, exotica and Hawaiian guitar, plus a love of that Asian sea full of islands, too many to visit in one lifetime, that centres on Borneo, and which Joseph Conrad called his magic circle.

Cooper has made his own environmental recordings in this part of the world - a hypnotic procession of frogs, fluting birds, insects and rain. Back home in Rome, he has added layers of playing and loops distant curlicues of steel guitar, the fluttering of a reversed drum machine, the muted rumble of noise improv repeating like the slap of water on the side of a boat. Music is mixed into environment so that it barely dominates - foreground and background merge. Bright strumming of a ukulele is heard, but at a distance, as if we are walking in a village and can't be sure where the music is located. These are dream landscapes, Cooper's personal responses to particular places. His previous *Kiribati* (reviewed *Resonance* 8:1) was a purely musical evocation of Pacific atoll islands. This time around, actual sounds of the environment are included, rather than evoked. Each musical gesture is quite small, building a delicate, warm texture, and the track is often propelled by a rhythmic fragment of guitar or bass. The listener is suspended in a hammock, peering through heavy eyelids into a heat haze.
CLIVE BELL

JazzKammer
Rolex
Smalltown Supersound STS045CD
AT A RECENT LMC WEBCAST THE UK Click'n'Pop Championships 2001 were staged. The imaginary live broadcast from the ICA bar, London, was not short of volunteers willing to construct brief works out of sound fragments. Looking back, perhaps this parodied the microsound genre too soon. Judging the contributions we were left to ponder the different agendas incorporating the glitch rather than ride along with its all too clichéd outpourings. This neo-pointillism is less a genre than a movement mediated through computer technology.

With their stylised 'cuts'n'clicks,' the Danish duo JazzKammer are certainly part of this movement. *Rolex* is a compilation of remixes of their previous two albums by Merzbow, Pita, Thurston Moore, Francisco Lopez and other less well known sound artists. Luckily for the less well known, it is they who fare best in these 14 disparate tracks. Jurgen Treen's 'Dupermix' explodes with its polyspatial counterpoint of digital distortions, while Alexander Ridhaug's 'Corn Flex.1.4' strips his sounds to empty syllables, brutally degraded sources and almost imperceptible gestures. Both tracks exhibit the kind of counterpoint and spatial interplay which characterises the more notable cuts, including Maja S.K. Ratkje's 'I Hate Cars' — which sounds like the film sound track for Princess Diana's last four minutes. Tore Honore Boe's 'Neon Express' creates an electronic jungle soundscape with a build up of insect-like chattering and squawking parrots of feedback. With its carefully constructed environment, this piece in particular stands out among too many rather static tracks, which sound like they were churned out in about five minutes. Complexity, genre-hopping material and ear-catching outbursts are now available to all — which presents the biggest challenge for musicians working in this field. The machines can do it all for you in a matter of minutes. Bummer!
TOM WALLACE

4 Walls
And The World Ain't Square
Red Note 09
4 WALLS IS VERYAN WESTON (PIANO); PHIL Minton (voice); Luc Ex (acoustic bass and guitar); and Michael Vatcher (drums). Teh group is descended from Roof, with Weston's piano replacing the late Tom Cora's eloquent cello. *And The World Ain't Square* is short. The pieces are recorded direct in one take without overdubs or editing, and the mix is very even between the instruments and very natural-sounding. Some of the pieces have words and a sort of structure, some seem improvised. All of them show a commitment to improvisation and risk-taking — using riffs and a rock idiom at times, but organic, chaotic, brave. What structure there is acts as a bridge to greater abstraction, notably in the first piece, 'The Anarchist's Anthem', which is a political and aesthetic anthem for this music as well — unabashedly, forthrightly anarchic. This and other songs with words are from the repertoire of the Minton/Weston duo, and remind the listener how splendid and radical that duo is, and how extraordinary their musicianship. Phil Minton's first interjection on 'Pliers' is a long sustained chord, the two pitches so separate, so vehement and equal, that I initially thought there were two people singing. *And The World Ain't Square* is full of such virtuosity, but completely apart from the world of music

as a competitive sport. This music takes the long way around to soul: slightly mad, exposed, unfashionably sincere, overtly engaged — and so refreshing, so inspiring and so encouraging to listen to.
CAROLINE KRAABEL

School Of Velocity
Homework
Grob317
SCHOOL OF VELOCITY ARE DAVE TUCKER (guitar), Evan Parker (saxophones), Steve Noble (drums) and John Edwards (bass). Comprising five pieces, the shorter 'Open Plan' suite represents the more reflective and minimal aspects of this group's creativity, for this is predominantly heavy music — heavy in the sense of high density. This is also music where rock meets free jazz — not as stylised fusion, but as a combination of the aesthetics of genres given individual twists. What I particularly like about *Homework* is its sense of a group identity which evolves through the process of recording, the sense of something unfolding rather than done and dusted. Tucker is particularly interesting in this setting, avoiding rock clichés and coming up with plenty of challenging musical ideas. Edwards's earthy, textural playing is noteworthy throughout. Noble combines detail, space and propulsion with a remarkable dynamic range and acute sense of timbre. Parker, who favours tenor saxophone for the greater part of the disc, pursues a predominantly rhythmical path, simultaneously propulsive, vibrant, heavy yet transparent. His punishing articulation and manipulations of the reed give shape and line to wonderful abstract phrases, critically adding to the cogent sense of velocity much in evidence on this record.
GRAHAM HALLIWELL

Jim O'Rourke, Michael Prime, Eddie Prevost with Adam Bohman & Andy Hammond
Alpha Lemur Echo Two
Mycophile SPOR 05
EXTENDED IMPROVISATION WITH AN IMPRESSIVE line-up and intriguing atmospheres. What's magnetic about these recordings is their characteristic subtlety. On the first track, 'Lemur,' O'Rourke, Prevost and Prime trace the performance space, the sounds sucking in the room's acoustics as they smear into each other's path. The blend of individuals is fascinating, quiet, gentle, no force or fever. All allow their sound to breathe. There is an overall sparseness that is not tentative but felt. Prime's bioelectronics are more vital here than in isolation, creating the atmospheric surface tension and entering everything else. Prevost shows how percussion can behave beautifully when not too concerned about its identity. O'Rourke's inputs create lines that are variable and coherent. 'Lemur' is a carefully interweaved evolution of complimentary sources which reach out from, embrace, and return to the space of their creation. Emptiness is welcomed, punctuated with subtleness, accident and combined sensitivity.

On 'Alpha,' Prime and O'Rourke play with Bohman and Hammond, again focused on discovering an atmosphere. At first I was unable to get beyond a comparison to post-industrial sound-scapes, but on repeated listening its roots reach back further in time, and it has an incredible sensitivity as it slowly evolves. The intertwining threads travel to an intensity, then drop away at the end. Recorded four years earlier than 'Lemur' in 1990, in a different space, it is nevertheless a choice accompaniment to complete a worthy CD release.
SARAH WASHINGTON

Noble, Edwards and Ward
False Face Society
Incus CD 47
THE GUITAR/BASS/DRUMS TRIO IS A CURIOUS beast when not confined to the narrow restraints of rock. Think of Fushitsusha and of Caspar Brotzman's trio: both offer an intense wall of sound from the lead instrument on top of a fairly leaden rhythm section. Massacre are at their most exciting when playing their shorter more structured pieces. When they improvise they tend to meander. The Hear Scheidt Report remain a folk myth, essentially an improvising trio dipping into grooves. The music that the False Face Society most resembles is that of Derek Bailey and The Ruins. It's the guitar style, the angular paint-stripping shards, but whereas Bailey seemed to be the only one truly improvising and interacting in that group, False Face Society are equal contributors, each participating with equal intensity, dynamism and control. The music evolves, sways, shifts as an organic creation, each player prepared to take the lead without becoming the leader, to create a veritable temporary autonomous zone. Ward is perhaps the only member wearing a false face, but it suits him. He is renowned for his clarinet, but here he is, axing lyrical with the same venom and authority, the same excoriating incandescence. At times, you hear traces of Ray Russell or maybe Brian Godding, and even James White and the Blacks. Edwards eschews the rock format of the bass guitar, and is a master of the big yin, providing a depth, colouring, timbre and percussiveness which sets him apart from other pretenders. Noble displays the energy, subtlety, precision and mastery that make him one of the finest skinthwackers on the scene. This is a pretty damn fine record, the sound of the dynamics of social revolution unfolding before our very ears.
IVOR KALLIN

Åke Hodell
Verbal Brainwash and Other Works
Fylkingen FYCD 1018-1-2-3
AFTER DECADES OF OBSCURITY AND independent music making Hodell's work has come of age. At last his harsh splices, numbing repitition and skillful use of experimental techniques fit in seemlessly with today's tolerance for all things extreme. It's almost as if he has been a big influence on everything from industrial music to electronica. This has certainly not been the case. The original releases of these works are scattered over a variety of highly obscure Swedish LP's which hardly got distributed outside of Sweden. In particular there was a series of landmark compilation LPs that documented festivals of Swedish sound poetry between the years 1967 and 73 where Hodell appeared on two volumes. Seven volumes appeared in all, and a reissue of these would show just how unique were Hodell's use of the limited facilities at Swedish Radio. Much of the brilliance of his work stems from its simplicity. It's like being shown the obvious for the first time. Why don't more people work this way? Why didn't I think of that? The formulae he uses thoroughly explore each idea he lights upon — chopping things in, changing inflexion, repeating, evolving and returning. Often it's not at all complex, but it is musical. There is a strong text based element throughout, as well as abstract vocalisms. Hodell's subjects were either an ardent anti-capitalist libertarian message, or settings of classical myths. Many of the pieces stem from commissions for radio programmes, but the primary focus throughout Hodell's career is what the Swedes called sound text poetry (*poesie sonore*, concrete poetry or sound poetry), and like many of his international associates Hodell was also involved with written/visual text pieces, not to mention his figurative collages and his work in theatre. It's hard to sum up but a strong sense of theatre comes through in much of this work, like a kind of industrial radio art. No, it's a classical electronic concrete noise thing. No. It's an experimental ambient sound text thing. I give up. It's unique, and it's all his work in one place, it's three CDs for the price of two, and it's one of the best and most important reissues of the last few years.
CLIVE GRAHAM

Book review

Michel Ratté

L'expressivité de l'Oubli. Essai sur le sentiment et la forme dans la musique de la modernité

IMPROVISED MUSIC TURNS OUT TO BE LESS CENTRAL TO RATTÉ'S intellectual project than I had expected, having translated his essay 'Improvisation as Form' for *Resonance 6.1*. His new book is first of all a book on philosophy (also FOR philosophy, FOR certain perspectives being more philosophically valid than others), and second an analysis of music in general, to which Ratté's writing on improvisation forms a minor appendix. The book is problematic, sometimes in a good way, sometimes in a bad way.

Taken together, the title (The Expressivity of Forgetting) and subtitle (Essay on Form and Sentiment in the Music of Modernity) don't define a project of integration so much as the distance between two fields of enquiry.

Ratté hasn't always succeeded in laying out his argument in a sequentially coherent form. This makes an uncritical summary difficult; one is provoked from the beginning to read from a firmly outsider perspective. Ratté wants philosophical legitimacy.

What is meant by a philosophical argument (in the bourgeois tradition) involves a reluctance to consider the objective nature / to attribute any nature to the object of consideration, concerning oneself only with the nature of the approach to it.

The difficulty is that under the guise of not saying anything about the real this kind of argument ends up with a reductive facticity that passes itself off as a necessary aspect of the truth of the approach. My perspective is musicological and anthropological. For me it's worthwhile making specific observations about human lives and human musics. I'm more interested in the pattern of what I'm looking at than in the truth of perception.

A possible reading of Ratté's argument would go like this:

Human beings are inherently social, but retain an elemental need for unmediated self-relation which is betrayed by the communicative and representational approach to the self imported from social life. Loss of representation therefore becomes the searched-for experience of the human subject, the only way it can confront itself. This loss of representation is the awareness of forgetting. Music offers another approach to the self because it can provide this awareness of forgetting. Two important sub-themes concern sentiment in music and modernity. Music is the expression of a specific dimension of human self-feeling - the feeling of forgetting. Ratté sets out to examine the connection between the immanence of form in music and the immanence of this specific dimenson of feeling.

The important point here is the 'immanence.' The classic (going back to the ancient Greeks and running forward into romanticism) theories about sentiment in music have presented the relation as 'external': that is, particular musical gestures, or elements, represent emotions or indeed the way in which emotions are otherwise represented. The relation is either semantic or mimetic, or a mixture. Or somehow meta-mimetic, with the movement and dynamic of the music corresponding to the movement and dynamic of emotional life. Hegel is the first philosopher to suggest that music, by negating representation, expresses the actual movement of interiority. Music pushes interiority back into itself by virtue of the evanescence of sound. This is quite different from the transcendentalism of Schopenhauer et al. However Hegel's thought is limited, so to speak, by its grandeur, and he is not concerned with the dialectical processes of actual pieces of music in time so much as with the historical dialectic that makes of particular types of music epochal allegories for particular types of relation between spirit and its material expression. Ratté phenomenologises Hegel: the constant disappearingness of sound becomes, for Ratté, a protosymbol of the subject's incapacity to represent itself. The sending back of the self to itself in music is now seen as the content of the music. The music is about the defining of the subject's interior in terms of the sensation of forgetting, of being rid of all representation - which is brought about by the particular mode of the disappearance of the (sound) material in music. Thus what recurs in music is not remembered, in the sense of being held in memory, but re-remembered.

Turning to what Ratté says about modernity, modern art in particular suspends itself in the fault-lines and ambiguities of representation and thereby gives back to the self the sentiment of forgetting. (The multiple misunderstandings in representation constitute the model for art, a form of communicative activity that differs from day-to-day representation. Art is driven by the particular energy of a self that finds itself, on the one hand, brought into relation with itself by the possibility of communication, and on the other, constantly misrepresented by the inherently intersubjective characteristic of that communication.) The tendency of art to become more concerned with the problematicity of representation corresponds, for Ratté, to an increase in the reflexivity, and therefore the autonomy, of the protosymbolic element which has been present in symbolisation from the beginning. If this is so, modern art - in terms of what specifically identifies its modernity - is part of the crisis of modern society and not a response to it. The best that modern art can do is to render the crisis more urgent by its insistence on the demand for a different realisation of the social bond. Ratté refers to Michel Henry's writing on Kandinsky. Kandinsky's lines and points illustrate a wider truth about the phenomenology of being: there is a sensation and a movement of being that does not arrive in representation but that is proto-symbolised in the body and its movements. To my mind this is one highly fruitful line of enquiry that he doesn't develop here, pointing to, amongst other things, the work of Eugenio Barba in theatre and Barba's concept of the 'pre-expressive'.

Are we all really babies inside, and is modern music in all its representational problematicity the cradle-song we never had?

Surely the proposition that human beings have an inherent need for self-relation is an example of reductive facticity aspiring to a kind of philosophical self-evidence. Because Ratté's professional bias excludes him from enquiry into psychology and linguistics his notion of this 'self' remains unsituated and abstract. Granted, an inner self fixated on fogetting wouldn't make a good Jungian self with its enthusiasm for memory. But one way of situating a need for loss of representation would be within a Dennett-type model: here the only self is a socially constructed narrative continuously glossing over the actual discontinuity, modularity and plurality of the actual working mind.

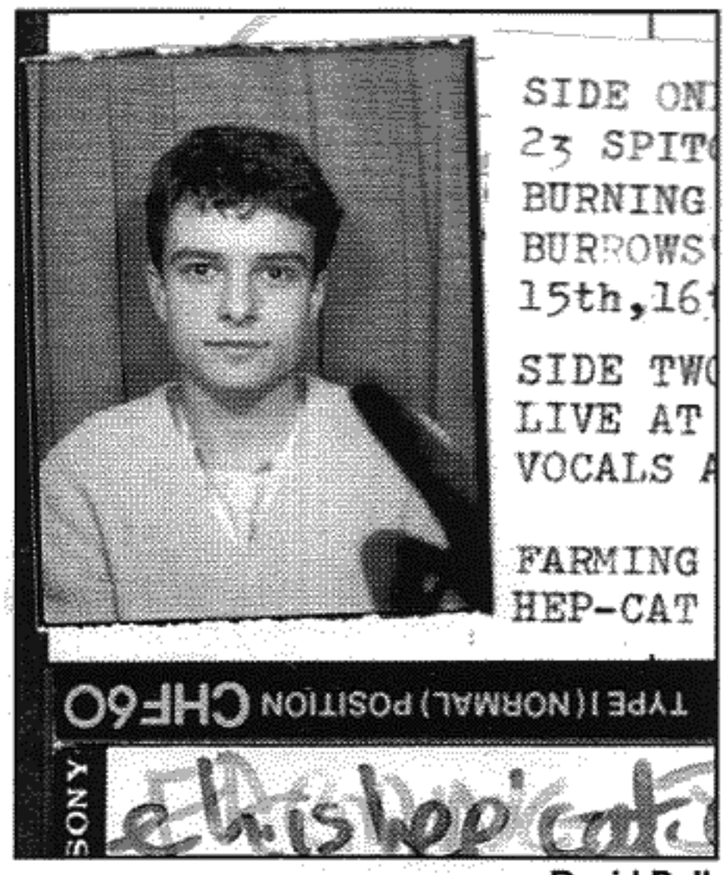
TIM HODGKINSON

Michel Ratté, *L'expressivité de l'Oubli* (Bruxelles, La Lettre Volée, 1999).
Michel Henry, *Voir l'Invisible: sur Kandinsky* (Paris, Francois Bourin, 1988).
Eugenio Barba, *The Paper Canoe* (London, Routledge, 1995).
Daniel Dennett, *Consciousness Explained* (Boston, Little, Brown, 1991).

Letters

The *Juvenile Nation* article (in issue 8.1) was a great nostalgia trip, coming as it did not long after an invitation to attend a school reunion, and the release of the *25 Years of Rough Trade Shops* CD. And, last weekend, I was trying to retrieve a lost sock from behind a chest of drawers, and unearthed piles of old cassettes stacked underneath, gathering dust. The reminiscences in the article certainly capture something of the 'scene' as I participated in it, in the early 1980s. It was a heady hybrid, sparked by the DIY ethos of indie bands, the fanzine culture, mail art, and helped along by institutions from John Peel to the *NME*. Even my local branch of HMV sold fanzines back then, and our favourite independent trader stocked all kinds of esoteric records, tapes and zines. There was a real anyone-can-do-this egalitarianism to the scene, a wilful amateurism and a relish for experimentation. Technology had a key role to play — the photocopy shop, the glue stick, the tape-to-tape cassette player; but also the circulation of second-hand technology, helped out by things like the car boot sale, where we could pick up battered musical instruments, and (my own favourite) old reel-to-reel tape recorders. Flotsam and jetsam for our playful music-making also included toys, household objects, borrowed instruments — anything that made a sound we considered worth using, from power tools to purring cats. For me, it evolved from earlier games, when me and a friend spent hours doing 'radio shows' on tape, making silly noises, playing our parents' records (plus our own Muppets and Wombles LPs) and doing daft American accents. Graduating to music was obvious; all we needed was someone's bedroom and a bit of enthusiasm.

Some of us had proper instruments and went on to learn to play. Later there were songs, even. But at first it was Bill 'n' Ted style improv. FQ21C (first quarter of the twenty-first century) was an irregular jam session round my mate Billy's house, usually curtailed by his parents complaining — a moment always caught on tape and left on the final recordings. Extended work-outs satisfied some band members' interests in prog rock and heavy metal. The recordings were for our own consumption, listened to with a mix of seriousness and hilarity. Then *Sounds* and *NME* started publishing columns about tape culture, and most people were into the free exchange thing — no money involved, just sending blank tapes and SAEs or swapping each others' recordings. I got a tape-to-tape for my birthday, and started my own label — Mudbath Tapes. I can't remember the back catalogue, but it ran to perhaps a dozen



David Bell

tapes, including compilations and stuff that other people let me put out. I did one or two things, like a half-hour improv tape made using one cymbal, borrowed from school. Then the Casio VL-Tone came onto the market, so we started to use its drum machine patterns — though it soon became a stale, clichéd sound on the scene.

This was an amazing period, equally so for the friendships that grew around the almost obsessive letter-writing culture the tape scene seemed to propagate. There were people I wrote to daily, and the sound of the post van drawing up the street was so exciting — it still gives me a buzz. I made friends with people from all over, including Mike Stout, from Romford, who was in a great band called What Is Oil?. They specialised in very short 'songs' (48, I seem to remember, on their first hour-long tape) using household objects (one I loved was strummed on an egg slicer), and we ended up forming a band called Farming Jim and his Hepcat Groovsters (FJ). We did some tapes, and lots of swapping. We made contact with the scene on mainland Europe, where the tape culture was huge. There was a great Belgian zine, *K7G7* ('Cassette Gazzette') that reviewed hundreds of tapes, and was written by a wirey middle-aged man called Alain. The Belgian tape scene was really interesting, with a slightly older crowd (in their early twenties) doing either hardcore industrial noise (Angst, Force Mental), quite highbrow improv (Such Interesting People) or very funny 'bad' music (One Hundred Poems from the Japanese). One summer FJ visited Brussels and Gent, played live with some of the Belgians, did lots of recording (getting introduced to things like prepared guitar and effects pedals), and had a wonderful time. FJ carried on a while, transforming into The First Church of Napoleon Solo and even doing a 7-inch, complete with hand-painted sleeves, but I got more into the fanzine/mail art scene, and Mike started running a club, zine and then a label in Leeds, as well as playing with The Wedding Present and the Bachelor Pad. I ended up drifting out of the scene while at university, though I kept in touch with some folk for a time.

The music was incredibly diverse, though there were common elements — the use of found and made instruments, kids' toys, unconventional techniques (one of my favourite tapes was recorded in the back of a car, played entirely on beer cans), covert recordings, amateurism — What Is Oil? had a tape called, with some irony, *Musical Talent*, and cut up a recording of their headmaster's end-of-year speech.

Sometimes the results were bad, but more often they were at least interesting. The aesthetic was home-made and proud of it — the covers, even the labels on the cassettes, meticulously made on photocopiers or by hand, tapes numbered before being dispatched, endless junk crammed into envelopes as freebies. Our musical influences were mainly from within the scene itself, though 'proper' bands like Swell Maps, Nurse With Wound, The Fall, 23 Skidoo and Alternative TV were always on our playlists, and we tried to learn and steal from them. We discovered Burroughs from Throbbing Gristle, and got into the cut-up method; we even tried primitive turntablism once we heard Grandmaster Flash. Nothing was inconceivable, it was always worth a try — and worth putting out. For the cost of a couple of second-class stamps, you could have a daily flood of new sounds on your doormat.

Eventually other things took centre-stage, though I continued my involvement in the mail art scene and the letter-writing scene for a few more years, and still got tapes from friends occasionally. More recently, I've begun to take an interest again in the 'improv' and 'avant garde' scenes to which the Belgians had introduced me — they sent me tapes of everything from Harry Partch and Derek Bailey to Ivor Cutler and Lee Perry. And I've found a couple of other people from the tape scene in my new life as a lecturer: Paul Rixon teaches at the same university as me, and he ran a label called (I think) By Joopiter and had a band called the Rig Veeda; and Paul Rosen, aka Paul Platypus, teaches up in York, and we've been in touch through work things. He did the brilliant zine *Wombat Weekly*, and played in bands like Twelve Cubit Feet and Doof. He even had a music publishing arm, Cubic Music, which owns the publishing rights on the single we did. Where's our royalties, Paul?

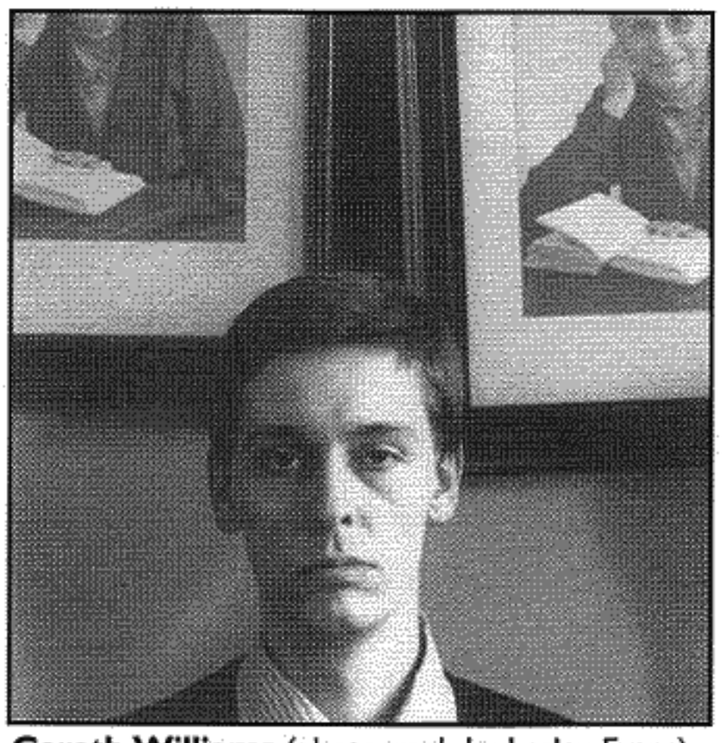
DAVID BELL
d.bell@staffs.ac.uk

Gareth Williams (1953-2001) Obituary by Ed Baxter

GARETH WILLIAMS, WHO HAS DIED OF CANCER aged 48, was a founder member of This Heat, a rock trio whose significance and musicality the historically minded listener would favourably compare to Cream or the Jimi Hendrix Experience, but whose recalcitrant experimentalism led them far away from mainstream success.

Williams was born in Cardiff in 1953. After taking his A-levels, he took up a job as a Drugs Rehabilitation Counsellor in Newfoundland. By the mid 1970s he was working in retail as the deputy manager of the Cranbourn Street, Westminster branch of HMV, a post he held with a madcap degree of irresponsibility. Once, to win a television set offered as an A&M sales promotion, he purchased for the shop hundreds of copies of Rick Wakeman's 'The Six Wives of Henry VIII'. On receipt of the tv, he returned the records as faulty, having himself scratched and made unsaleable the entire shipment. Williams was a fanatical listener and record collector and as such attracted the attention of guitarist Charles Bullen and drummer Charles Hayward.

Hayward was rehearsing with Bill MacCormick, bass player with Matching Mole, the pair having been persuaded by an unexpected Top 30 hit to reform Quiet Sun, a band they had formed at school with Phil Manzanera, then guitarist of Roxy Music. Bullen handled the guitar parts and Williams was brought in to add a missing spark of vitality to the group, but his lack of musical training was anathema to Quiet Sun's formal brand of progressive rock. For Bullen and Hayward, however, Williams was a revelation, a maniacal performer whose intuitive approach was urgent and deeply liberating. There had been non-musicians working in rock before, notably Brian Eno in Roxy Music, but Williams was perhaps the first to take centre stage rather than being merely adding colour to familiar forms. The trio set about reinventing rock in a manner reliant on accident and deliberately devoid of technique. This Heat played its first concert on the February 13 1976, mere days after it had formed. (As a sign of their confidence from the outset, they included



Gareth Williams (photograph by Lesley Evans)

'Rainforest,' recorded at this gig, on their debut LP). In the early days noisy instrumental improvisations dominated; but This Heat were also adept at songs and gradually achieved a balance between the abstract and the formal. In concert, trance-like ambient soundscapes would typically fade into riotous, even danceable, anthems before giving way to a heady shower of glorious noise or leery episodes of half-stoned silence. This Heat attracted an audience of fervent admirers and enthusiastic critics, for whom Williams became 'the musician's non-musician.'

This Heat took to using tape recordings in concert, with Williams becoming adept at playing cassette machine as a solo instrument. For them tape was a legitimate element in its own right, a creative rather than recreative musical source which allowed them to bring into the mix sounds from another time and place. It provided This Heat with an other-worldliness which arose directly from their own lives and previous playing experiences and which lent the band a singular vibe of vertiginous alienation. They played at extremely loud volume, usually in pitch darkness. From the start, and with a kind of light-headed arrogance born of the unexpected discovery of something new, This Heat deliberately set themselves apart from other groups, an attitude that prefigured the punk explosion that followed and partially engulfed them a few months later - and which they in turn influenced as pub rock simplicity gave way to post-punk experimentation. They issued a spoof manifesto: 'This Heat was made out of the collective desire of its members not to be in any other groups.' They set up their own rehearsal and recording studio in Brixton, Cold Storage. Here they recorded their first album, 'This Heat'(1979), taking over two years to assemble it. The maxi-single 'Health and Efficiency,' perhaps their finest single work, was released in 1980, a deliriously upbeat song 'about the sunshine' which allowed Williams to display his now considerable skill as a musical bricoleur. This was followed by 'Deceit' in 1981, an LP which put its finger on that fearful era's g-spot, decrying the nuclear arms race and media disinformation in a sequence of exquisitely executed but agonised songs. If it voiced a bitter anger at the world in general, 'Deceit' perhaps also articulated the tensions within the band.

By the time it was released, Williams had quit the group. Having once declared that This Heat was the music the three of them made together, Bullen and Hayward nevertheless carried on, now joined by bass player Trefor Goronwy and keyboardist Ian Hill. The band's final concert took place in London on May 18 1982. By then Williams was in Kerala, south India, where he studied kathakali dance-drama. He converted to Hinduism, mainly to gain easier access to temples. On his return to London, Williams co-authored the first edition of 'The Rough Guide to India' and took a Degree in Indian Religions and Music at the School of Oriental and African Studies.

In 1985 Williams with his friend Mary Currie made 'Flaming Tunes,' a collection of raw yet plaintive songs, domestically recorded and released more or less surreptitiously in a hand-coloured cassette package. While This Heat was angrily engaged with social issues, 'Flaming Tunes' found Williams in a calmer, introspective mood, singing suggestively autobiographical fragments: 'My body moves forward. This restless mind runs back like a banner that flaps in the wind.'

In the 1990s he played with Hayward in the short-lived avant-rock project, Mind The Gap, and was one of many players featured in Hayward's monthly 'Accidents & Emergencies' improvisation series at the Albany Empire in Deptford. He was also active as a promoter as well as working occasionally as a DJ and pursuing his own musical projects, recording obsessively at home, notably with Martin Harrison (one of This Heat's pool of engineers) and singer Viv Corringham. The advent of compact discs had led to a renewed interest in This Heat and the albums were re-released on These Records, along with the archival 'Made Available: John Peel Sessions' and 'Repeat'.

Williams was diagnosed with cancer in September 2001. Early in December 2001 the three members of This Heat got together once more and tentatively rehearsed with a view to a live performance or new recording. Before any resolution to their diverse musical or temperamental differences could be reached Williams died, on Christmas Eve. He is survived by his partner, Nick Goodall, who he met at primary school.

Gareth John Williams, musician, born April 23 1953; died December 24 2001.