**LAURIE SPIEGEL interviewed by Cole Gagne for "Soundpieces 2", 1993**

Q: How does someone who left high school and taught herself to read music notation wind up getting her B.A. and M.A.?

SPIEGEL: I went to a great college called Shimer in western Illinois, which took me without requiring me to finish high school. It was an experimental offshoot of the University of Chicago, which gave you no usable skills whatsoever, but gave you a great basic education in thinking. My B.A. was in the Social Sciences, so my M.A. in music took a long time to get, because I had to go back and fill in a lot of missing music education. But I'd played music by ear since childhood, so a lot of the theory was, effectively, just learning the names of things that I already knew by sound.

Q: Through playing the guitar?

SPIEGEL: Mostly. When I was 14, in Chicago, I got myself a Harmony guitar, stamped "Factory Reject," cheap. My grandmother from Lithuania played mandolin and had given me a mandolin when I was maybe nine or ten. I kept it like a secret under my bed, and I would take it out at night and play sad melodies against a drone string. I got into making up music as sort of a private way to express — to deal with — my emotions from being a kid in a difficult family. At some point, my mother gave me a harmonica which I liked a lot too. But I didn't have childhood piano lessons. I'd been improvising and playing guitar, mandolin occasionally, and then added banjo because there were always too many guitar players. In the early '60s, folk music was in and was genuine. By the mid '60s, I'd reached a point where playing music and some other things in my life kind of dead-ended. I'd dropped out of college, and was living in a house trailer in western Illinois, near the Mississippi River, with no electricity — just a kerosene lamp — and no running water, no phone, no TV or FM radio. There wasn't much else to do but read and write and play music, and I felt I was just playing the same stuff over and over. So I decided I'd teach myself to read notes; and also to go back to school. I haven't been in a rut since.

Q: You used Bach scores as your guide?

SPIEGEL: I got a copy of Bach's Two- and Three-Part Inventions and tried working them out on my guitar.

Q: At that time, were you thinking at all about electronic music? Had you heard anything then?

SPIEGEL: No. I hadn't heard — and didn't know about — electronic music, or hardly any 20th-century composed music either, really. I had messed around with tape recorders since I was little though. My father was extremely fond of gadgets. He built things with pulleys and gear-wheels, and had a sequence of small businesses building things like parade floats. He was sort of an inventor, and had some patents for pump designs from when he was trying to build small fountains. He taught me to solder when I was nine or ten — I think it was the only thing we did together during my whole chldhood — and talked me through building a crystal radio. We had always had wire or tape recorders, and I discovered pretty young that if I cut the tape with scissors and got a piece of adhesive tape out of the medicine chest, I could tape the pieces back together in a different order. So I discovered splicing by myself, without knowing the word, and messed around with tape a bit.

But starting when I was 7, I thought of myself mainly as a writer. I knew I had to be some kind of artist — my subjective experience was too different from how it was "supposed" to be, from what the grown-ups told us kids was happening. I felt a real need to tell things like they were, like they felt; a need for emotional honesty, which I hope comes across in my music.

When I was 17, they said, "What do you want to be when you grow up? Where do you want to go to college?" When I said, "I want to study music," they said, "You can't do that — you're 17 and you don't read music and you've never studied it. Next subject?" Of course, at that time, the placement exams they gave us in high school were segregated for girls and boys, and everything I wanted to be was for the boys: They got doctor, we got nurse; they got writer, we got librarian; they

got scientist, we got lab technician — all like that, right down the line. Later, when I was in England studying at Oxford, I took classic-guitar lessons from Jack Duarte in London. He also turned out to be a composer, which was great. He taught me a good bit of theory as well. I'd begun writing down some of my improvisations when I started being able to read notes; just trying to get down things I'd made up so I wouldn't forget them. He pointed out to me that that was called "composing," and that if I wanted to pursue it seriously as a thing in itself, in addition to just playing, then I should do the same thing as with playing, namely just do it every day. It didn't matter if I threw it out, just that I get in the practice of doing it a lot. That stood me in good stead later, when I was composing on deadlines for films; though I tend to work in binges, I know how to make myself work. The thing about composing was, I'd never met anyone who did it. It was not something that people did. I knew writers and artists, but I didn't meet composers. There was all this incredible music which had somehow once been composed — case closed.

At Oxford I discovered that if I sat in a corner and played my guitar and just made up things, people liked to have me around a lot more than if I was all excited about ancient Greek philosophers, or really furious with what the logical positivists were doing to Kant — one of my absolute favorites. People seemed to like me better if I just played music. I think being intellectual was considered a man's thing still. They didn't even allow women Rhodes Scholars till 1976; I was there on a special undergrad program. I still thought of myself as a writer till about age 23, when music really just took me over. Then I realized I had to give it a chance, that if I didn't give music a year, I'd regret all my life not having tried to see where it might go, because I loved it best.

Q: Was Oxford part of that effort to give music a chance?

SPIEGEL: No. Part of it was coming home to Chicago after two years at Oxford, with my new Social Sciences degree, landing in the middle of the 1968 Democratic convention, with tear gas and tanks all over the place, then moving to New York and getting involved in political

activism to the point of utter disillusionment, which a lot of us felt that year, '68, '69. I realized I had more hope of making a positive difference in this world by just touching people inside with music than through politics. Also I discovered that, despite being allegedly bright and even "Oxford educated" and all, that the only work I could get was as an underpaid, overworked secretary or file clerk. Things were a lot more sexist back then. I did try applying to IBM to train as a programmer, but they said that I didn't have what it took; I think they took one look at me and decided I didn't fit their stereotype of what a programmer should be as a human being. I had no problem learning to program later, once I got access to computers. Anyway, that first year in New York was pretty miserable. I wasn't able to make contact with anyone with similar cultural interests, and I couldn't get any work that was above the drone level.

Q: When did you start going to Juilliard?

SPIEGEL: I had a roommate at one point who was just starting at the Manhattan School of Music. She was a pianist and I didn't think she was that great in terms of musicality, and I thought, "Well, if she's good enough to get to study music, maybe I can too." Ultimately, I did get a Masters in Composition, though it's never been much use to me. But some people like to know I have it, like when I've taught music at colleges.

Q: Living with this person prompted you to apply to Juilliard?

SPIEGEL: Yeah, but I didn't really apply at first. You could just start taking courses through the extension division, and if you did well, they couldn't get rid of you. They had to let you more and more into the regular division, even graduate courses. And then I just kind of got adopted. Persichetti would keep giving me lessons; he'd see me in the hall and say, "You've got five minutes? Come into my office and show me what you're working on," and he'd give me these little lessons. And for many years after I left there, he'd phone me once in a while to ask how my composing was going — he cared. And then I studied for several years with Jake Druckman, and was his assistant privately,

proofreading orchestral parts, typing up his ASCAP reports, doing sound checks, tape editing for him, those things.

Q: At Juilliard, had you wanted to compose, or was it more a matter of getting involved in music at all sorts of levels?

SPIEGEL: I'm not even really sure. It was still beyond my wildest dreams to become a musican of any kind. I loved music and was playing a lot, and I wanted to learn: I wanted more technique, history, theoretical understanding. Thinking of myself as a composer happened *ex post facto*, years later. I played classic guitar, but soon realized that the pieces I liked most were all transcribed from lute. So I switched to the lute and started getting little gigs — like being onstage lutenist in Jacobean revenge tragedies.

The Juilliard drama division was great but the music division was very uptight. You had kids with incredible chops who couldn't play a note of their own free will; it had to all be written out by someone else for them to read, sort of like knowing how to talk but not being able to just express yourself in words, not being able to speak without a script someone else had written. I couldn't believe it, because my own musical experience had been almost entirely self-expression, communication, and folk music — music by ear. I mean, where I came from, Dylan was considered too commercial at first! I'm originally from the south side of Chicago, 49th and Woodlawn, and blues was in a way an ultimate thing. I never got involved in jazz. Blues always felt much purer to me, much stronger, deeper, less about virtuosity, technique, theory, novelty.

By the end of that first year at Juilliard, I had aced the basic ear-training and theory courses, and taken some graduate seminars and coaching in Renaissance and Baroque ornamentation and continuo realization on the lute. I had also been introduced by my ear-training teacher Mike Czajkowski to the Buchla synthesizer at NYU — what was left of Mort Subotnick's old Intermedia Program, and I fell madly in love with electronic music.

Q: What prompted him to bring you to that?

SPIEGEL: I started showing him some of my compositions, and he said, "You know, there's something that I think you might really like. Why don't you just come downtown with me some time when I'm going to the studio?" He took me to Mort's studio, which was at that time over the Bleecker Street Cinema, but I didn't really start working with the Buchla instrument till it moved to the NYU Composers Workshop, which was underneath the Fillmore East, on East 7th Street. It was a basement studio with water bugs — when you plugged patchcords in, you had to be careful not to squish anything lurking inside!

Then there was an immediate link-up with video people from The Kitchen: We were painting the cabinets in the new studio blue to store tapes in one day when the video artists Woody and Steina Vasulka came in, and Woody said — really dramatically — in this gruff Czech accent, "Ve vant your ekvipment for our experiments!" So I rapidly got involved and met a lot of people at The Kitchen, when it was still at the old Mercer Arts Center, before the building collapsed. I had music in two of The Kitchen's first four concerts. Rhys Chatham, Eliane Radigue, and I had teamed up to tackle learning the Buchla, and we became good friends. So when Rhys started the music series at The Kitchen in '71, I was one of the people he could count on to throw in enough music during that first month to help launch it. I was still studying at Juilliard, which was uptight and had nothing to do with the real world, so "downtown music" was a good counterbalance — a lot more relaxed and fun, more people-oriented and open minded.

So by the end of that one year I gave myself to try music, I was studying, performing, composing, and had a job setting up a studio and teaching one of the first college-level courses in electronic music in the country, in Bucks County, Pennsylvania — I went there one or two days a week, teaching electronic composition and classic guitar. I also got a job as staff composer for a small film-production company called Spectra Films. It did mostly educational and kids' stuff, but was run by Fred Pressberger, an old Viennese Jewish filmmaker who'd been apprenticed to Fritz Lang when he was young. He taught me a tremendous amount about scoring films, where to put music, how and when to bring it in and out or go emotionally contrary to the action with it. These

weren't exactly major films, but I scored six of the Babar stories and other stuff I liked too.

Q: Those jobs pretty much paid your tuition at Juilliard?

SPIEGEL: They did, and my rent, amply. Rents were a lot cheaper then; tuition was high.

Anyway, by the end of that trial year I'd allowed myself, I was making more money, learning a lot, and having a much better time by being a musician — versus coming from Oxford's philosophy, history, and all, plus England's fantastic '60s counter-culture, into dead-end sexist typing jobs. It was clear I should stick with music.

Q: When Michael Czajkowski took you to the Buchla synthesizer, that wasn't part of anything Juilliard was doing to expose you to electronic music — he'd been working with that instrument himself.

SPIEGEL: Yeah, he'd worked very closely with Mort Subotnick. When Mort gave up the Bleecker Street studio and went out to Cal Arts, Mike took it over and ran it as the NYU Composers Workshop, which composers joined to get six hours a week or so of studio time, depending on how many people the time had to be split between. Also, sometimes, Jake Druckman would let me use his time at the Columbia-Princeton Studio, so I got to know Vladimir Ussachevsky very well, and Otto Luening and Pril Smiley and later Alice Shields a bit. So I had what might be viewed as a totally multiplexed musical life, because I was in Juilliard, the NYU studio, the downtown avant garde — the Kitchen crowd, where people wanted something either sonically involving or just nice to hear, and even beauty was OK. I also did music for plays and experimental video artists too — plus playing early music on lute, teaching music at a community college in the country — and the soundtrack job, where basically I worked like an illustator, and style didn't even matter most of the time, as long as my music helped the emotions get felt.

Q: Were those electronic scores?

SPIEGEL: It took me a couple of tracks to sell them on electronic scores. But I had to do a variety of styles, including traditional instrumental writing — I was studying it at Juilliard anyway. But the soundtracks' conceptual content didn't matter; if I felt like writing invertible counterpoint, I did — as an in-joke for myself; nobody was going to notice it. What mattered was the emotion.

Juilliard, was never post-Webernite serialist conceptual, like Columbia was; it was much more atonal expressionist. Being a conservatory, Juilliard was spared the integration into an academic atmosphere which put so many university-based music departments right down the hall from the math or physics department, so composers would begin to feel they had to be able to prove why they wrote every note, like in other fields. Juilliard had lots of musicians from all over the world, just about killing each other to play Rachmaninoff concertos. It had some very fine musicians on faculty, who really loved music. Unfortunately, it was a very competitive atmosphere. And unlike the downtown avant garde or soundtracks or folk music, Juilliard was still biased toward complicated, dense atonal stuff — still very European dominated, aesthetically. Also unbelievably apolitical: The year of the Kent State shootings, everybody just wanted to practice for faster trills. Every other college was up in arms demonstrating, but not Juilliard — except Noah Creshevsky organized a performance of *In C* as a protest at one point.

Q: Is is true that Elliott Carter wouldn't let you play your electronic pieces for the composition jury at Juilliard?

SPIEGEL: True. That was one of my lowest moments. It was not considered "real music" — nothing was admissable but my written scores, and I didn't really have that much written music to show, because I'd started composing late, and once I hit the synthesizers, I just fell in love with working directly with their sounds, and all the things I could do with them. My written music was also more traditional. I got highly mixed comments from various Juilliard faculty, some of whom were my teachers and some not. One teacher told me that the fact that I'd written a piece in E Minor didn't mean for sure that I didn't have any

musical imagination, but it wasn't a good sign — though I'd thought it a pretty natural thing for any guitarist to do. Once I brought in a piece that was six pages long and said, "I'm having trouble with this transition here; it just doesn't feel right," and I got this sexist answer, "This is fantastic! Do you realize how few girls can actually finish writing six whole pages of music?" — which was no help at all. It was OK if Xenakis came and lectured us and played his electronic music. But Elliott Carter gave me a really hard time. He probably wouldn't even remember it, but it was one of those things where I walked out of the room and just cried. He hadn't let any of what I considered my best work be heard.

Q: Because they were tapes of electronic music rather than scores for traditional instruments.

SPIEGEL: Right, though I did have graphical scores for some of them. The whole thing seemed oriented toward the minutiae of traditional notation, and demonstrating mastery of it, not about musicality in sound.

Q: It was also about trying to aspire to become like them.

SPIEGEL: For Elliott Carter particularly that was true. It wasn't true for Vincent Persichetti, who really did his best to help you be yourself, and who had among his students Phil Glass, Steve Reich, and Jake Druckman. He really cared about helping you do what you wanted to do, which is what I've always tried to do with my students. The thing is to give them the moral support and psychological guidance to be themselves, and the technique to do what they want, and to help them find their sensitivities and work with them on their problems. It's for them.

Of course now it's inconceivable that any music department, even at the high-school level, would refuse to accept electronic work as music. But I was at Juilliard from '69 to '72, and it was different then. But I did have my own balance, because I could use electronics downtown and in my soundtracks. It got even better balanced when I went to Bell

Labs, where they had computer-controlled analog sound equipment. After four years with analog synthesizers, it felt like the same kind of dead end as back in the housetrailer, in '65, on guitar. I needed memory, storage, and to be able to use more complex logic and go back to the same piece over and over to refine it, the same way I'd needed to learn notation back then.

I'd met Max Mathews and Emmanuel Ghent at The Kitchen where we'd all done concerts. They'd heard some of my electronic music, and I'd heard and been very impressed particularly by what Manny was doing. Bell Labs was wonderful; it wasn't a music department or art scene. It was an acoustic and behavioral research center, without aesthetic biases. A lot of scientists there loved and cared about music, but without haaving vested interests in any particular new-music faction. It may also have been the only computer music studio at that time that I — as a woman — would have been let into. Computers and composition were still both very male-dominated fields. If I'd managed to get into an academic studio, and could handle its aesthetic biases, I'd probably have been relegated to maintaining the studio log and bringing people coffee — the way Pril Smiley and Alice Shields really never got due credit for their work keeping the Columbia-Princeton Center going all those years.

Q: Were you still working with Jacob Druckman during the time you were at Bell Labs?

SPIEGEL: Yeah, they overlapped. After Jake won the Pulitzer, Brooklyn College coincidentally decided to upgrade its music department to conservatory level, and they offered to double his salary, I believe, if he'd go teach there. Juilliard, where he had been since he was a student, didn't really appreciate him or treat him that well, even after he won the Pulitzer, so he decided it was time for a change and took the offer. I was already working as Jake's private assistant, and Brooklyn made me an excellent offer too, so I went with him, and finished my Master's Degree there. They gave me free tuition plus a monthly graduate fellowship that was several times my rent.

There I met Wiley Hitchcock and got a research fellowship with the Institute for Studies in American Music. I took trips to the North Carolina mountains and taped banjo and fiddle tunes. I did lots of research on pre-Civil War American music, for projects that Wiley and also Richard Crawford were doing; also research for the 1974 ISAM-Yale Ives Conference. Wiley helped get me back to folk music's directness and freedom to be itself — like the way shape-note music enjoys parallel fifths, which were taboo at Juilliard. Brooklyn also let me do independent study, and gave me credits for work I did at Bell Labs, whereas Juilliard rejected that entire range of my work as non-musical. So I got the Masters at Brooklyn in 1975.

Q: That same year, Jacob Druckman said, "There's really nothing more horrible, more 1984-ish, than being present at a concert where there's nothing onstage except two loudspeakers." Did his attitudes toward electronic music play a role in your approach to it?

SPIEGEL: No. We were very different from each other on that. It has a lot to do with my having come from the Midwest, and having lived for several years in a very small town where you couldn't even get FM reception. Music was something you and your friends did, alone or together, playing it or listening to records. Concerts were foreign, distant ritual-like things you read about, for people in urban in-groups. For me, pretty much all along, the loudspeaker and the home were music's fundamentals, where music belonged and felt right. Also, it was obvious to me pretty early that concerts just were no longer the most efficient way to get a musical experience to the largest number of people — the purpose they'd developed for. I loved the actual sound and process of electronic music. I think Jake felt electronic sounds as different sorts of weird beings he could put into dramatic relationships with human musicians on stage: In *Animus I,* the speakers virtually attack the soloist. By the time he did the one for Jan DeGaetani, of course, the speakers were more supportive. But his music was essentially concert-oriented and mine wasn't.

I never wanted to do concerts. I wanted to do records and radio, and to write easy pieces with lots of emotional depth for people to read

and play at home, for their own enjoyment and to express their feelings. That's my philosophy in my computer software too, to try to make it easier for more people to express themselves in musical sound, people who'd love to play music but didn't get music lessons as kids or for whatever reason believed they couldn't, who — unlike me — gave up. For me, home was always the most import place for deep musical experience. Loudspeakers on stage seemed only a hair more artificial than music being onstage in the first place.

I felt very frustrated doing little electronic concerts in little SoHo galleries for little artist audiences, even friendly ones. I wasn't reaching the people I wanted to reach: people like me when I lived very isolated in the middle of a bunch of cornfields and needed music to tell me I wasn't alone in my internal experience and emotions. Those are the people I wanted to create for. As an artistic voice, just like when I was seven, I wanted to bring into shared experience all that private scarey stuff you think no one else feels, which overwhelms you when you're alone. I wanted to touch people deeply and ring true. I wasn't out to make history or change. To me, doing concerts was mainly a way to get well enough known that I could make records, get published, do broadcasts, and start really getting music out to people. It didn't work. Doing concerts just got me more concert offers till I gave up on it.

Q: Was your involvement with computers at Bell Labs comparable to your encounter with the Buchla synthesizer? Was there that same sense of having found your instrument?

SPIEGEL: Yes, but differently — more indirect and initially frustrating — because first I had to learn to program. Max Mathews told me, only a couple years ago, that when I started there, he didn't realize I didn't know how to program. I must have picked it up really fast.

Q: You didn't tell him?

SPIEGEL: Well, I thought I had. But maybe we each just assumed different things. He'd said, "Nobody'll tech for you here. You'll have

to do your own." And I said, "That's fine." Then I worked through all the examples in a standard FORTRAN textbook, and also worked with Manny Ghent, helping him debug, and I watched the logic. At that point, it was DAP 24-bit assembly language and FORTRAN IV. It's a different universe out there in computer space now, verbally; I still have stuff on punch cards. Bell Labs was state of the art, but for those days. We're talking about music made on room-sized 32k computers, with 8k of core the size of a refrigerator-freezer combination. If one balked, you'd kick it to make it work again. You could pull out a memory card, go down the hall, stick it into another computer, and it would still have the data on it, it was that slow. When we got washing-machine-sized one-megabyte disc drives, people were walking around saying, "How are we ever going to write programs that will fill up a whole megabyte of storage? It's so much room!" That sounds silly now, and modern programs are more complex, but programmers have also gotten sloppier too. It's ungodly the size of the programs we see these days, and how much hardware speed it takes to run them — too many layers between you and the actual machine to be able to see its untried potentials. I really enjoy the aesthetics of programming: efficient, fast, tight code is beautiful; I'm an oldtimer, I've programed for decades by now.

Other composers working with synthesizers wanted smaller, lighter instruments to take on the road for live concerts. But I was after greater compositional power and control, and the ability to design more complex logic, realtime interactive logic — the spontaneity of direct improvised expression, but not playing notes. I wanted to play levels and aspects and kinds of music that never even could be written down before, non-realtime, or described. That level of interactive power was unfortunately not possible many places, nor portable till much later: the era of MIDI, which — despite its limits — actually let me write a program like *Music Mouse*, which is an intelligent instrument, and have it go to 20,000 people, mostly to use at home. We were able to make intelligent instruments way back in the early '70s, by controlling analog synthesis equipment with a digital computer 300 feet away, over trunk cables. You kept having to go back and forth to repatch and calibrate — walking miles and miles and miles in a session! And then

your shift would be over and the next user would repatch and calibrate everything differently.

Q: At Bell Labs, you created *Kepler's "Harmony Of The Planets"* which NASA included on a recording on the Voyager spacecraft in 1977. Where is it in space now, do you know?

SPIEGEL: Two Voyagers went up. One of them is actually outside the solar system and has sent back pictures of the solar system taken from outside it. I'm not sure where the second one is, but it's quite some distance on a different path. The *Kepler* being on them was a wonderful thing to have happen. Even Max was very excited that something done in the Lab was on that golden disk.

Q: It's actually on an lp?

SPIEGEL: They made a gold lp, yeah. That was the best recording technology then. But what's really astounding is that the computers onboard those Voyagers — which were basically about Apple II-level technology — are still running and were programmed well enough to be reprogrammable from Earth as new ideas and procedures and software knowledge evolved. They continue to function — no one's heading out in a space shuttle to reboot a Voyager spacecraft computer that crashed. They were done right in a way that's almost unimaginable now, considering the state of today's technology.

Q: How did your involvement in this project come about?

SPIEGEL: There was a good deal of press after the first public presentations of the *Kepler* piece. Ann Druyan and Timothy Ferris thought it was something that would fit right in and brought it to Carl Sagan's attention, and they chose it as the first cut of the "Sounds of Earth" section of the Voyager record. It took me several months' work, but was at a time when I guess I needed a break from innovating, exploring; I needed work that was more cut and dry. It was a fairly straightforward translation of planetary motion into sound, as

conceived by an early-17th-century astronomer — Kepler's instructions for how man could hear, as music, the harmony which God had composed into the cosmos. It was good to do it. Things had gotten very busy and overloaded for me. I'd also been working on computer-generated video at Bell Labs. When you went those 300 feet between the analog and digital audio labs, you passed by this other lab that had these images growing on a display screen. It was irresistable — inevitable to make contact, which turned into a long, fruitful collaboration and friendship with Ken Knowlton, a great writer of both computer languages and evolutionary algorithms for images. I learned a tremendous amount from him. In 1974, I wrote what's now called a "paint" program but which I called a "drawing" program then, using a Rand tablet and lots of other input devices. We didn't even have a real frame buffer yet; lots of little probes stuck out of the back of one of the computer's core units and went into the back of this video monitor. The computer could open the shutter on a camera, then put up on the video screen all the pixels that should be green, then all the red ones, then the blue, then close the shutter and compute the next frame for the next ten minutes or so.

I thought, "Wow! This has got to go realtime and become a visual musical instrument!" But first it took months getting recordable NTSC video out. Then I took the GROOVE music software — meant for composing patterns of change over time, and got it to output image parameters in realtime on that other lab's computer. During this period I also got very involved in the Experimental TV Lab at WNET, doing soundtracks and also as a Video Artist in Residence.

By '78-9, I could do my first video pieces with my hybrid system at Bell: *A Living Painting* and one called *Voyages*, which used the same software for both music and image, but recorded at two different times on two different computers in two different rooms. I'd made it so I could record my drawing motions in real time, overdub additional drawing passes, use algorithmic logic to elaborate textures on them, and edit it all too. Max thought I was crazy at first, but after seeing me working on this for about three years, he came in one day and said, "You know, I think maybe you're really onto something here." I called the system VAMPIRE, for "Video And Music Program for Interactive

Realtime Exploration," and also because I wrote and used it mostly at night.

Unfortunately, soon after, we lost everything. There was the AT&T divestiture, and they went over to UNIX-based time-sharing systems, from dedicated computers, which precluded realtime work.

Q: And so Bell Labs ended for you around 1979?

SPIEGEL: Yeah. It all broke up — for us all in those labs — at the end of the '70s. A lot of people left. It became a different kind of place.

Q: In 1981, you told the First International Congress of Women in Music that there were a lot of musically adept people in the computer field, who were outside the new-music scene because "they didn't like the atonal music or art-world politics." Were you also describing your own situation?

SPIEGEL: Yeah. I'd already published my "Open Letter in the Wake of New Music New York" in Ear Magazine, about why I'd become as disillusioned with the downtown music scene as with the uptown one. My subsequent article — published in Ear, then rewritten for the New Music America '81 Catalog — went a lot further and even accused the new-music concert establishment of having a vested interest in keeping us from reaching wider non-concert audiences through the use of newer media, which might make our work self-supporting without them. After that I got very few concert offers ever again.

By that point, I was already involved with the Apple II computer. At first, I saw these little micros, and thought, "This is a joke. How can you program something where there are no flashing lights so you can't even read the binary numbers in the registers? You can't even get at the actual computer inside, only at a keyboard. And it's so tiny." But then Jef Raskin brought me this prototype 48k Apple II, and later, Steve Wozniak looked me straight in the eye and said, "Laurie, do music with it! That's what I built it for!" — because Woz loves music, despite his "Us" Festival not being the greatest success, and Jef Raskin is a fantastic musician. There was a lot of love of music at

Apple when it was still only about four people. The Apple II put me in touch with a grassroots personal-computer movement.

Before micros were considered viable for business use and got really commercialized, it really was a counter-culture movement — about putting into the hands of the people a power which only the banks, utility companies, government, and military — "Big Brother" — had had till then. That's where the old scarey stereotypes of computers came from: their early owners and how they'd used them. Notably, ironically, that AT&T divestiture that clobbered our lab was all about this kind of thing. AT&T was about the only information carrier which did not in any way try to control the information content its channels carried — it just provided signal connection as multi-directionally and cheaply as it could, but it was barred from digital stuff till that divestiture trade-off; that's why the French have a computer terminal in every household's phone now but we don't yet.

So I got involved with these little computers and got excited, breaking out of a New York ghetto into a big grassroots thing, working on software for lots of people to use, putting out pieces on floppy disk, or distributing sounds by modem. But as soon as I started working with micros, nobody wanted to hear my studio compositions any more. If I couldn't play it live, they didn't want to hear it. And there'd never been much interest by performers in my instrumental works; people wanted the electronic ones, and now they only wanted them if I played them live.

I'm a composer; I can't do my best work if I'm limited to what I can schlep around or play live. I need my studio, I need more equipment, and to be able to take my time and do things over. Back in the early '70s, I was relieved when things worked out well for me as a composer, so I wouldn't have to be a performer. Though I'd always wanted to play music, and to learn to play better, I'd never really wanted to perform. I was always nervous and unable to sleep before, and depressed after, a performance — though I can get up on a stage and generate energy, and no one knows I'm scared stiff. But concerts had just been a way to get well enough known to get to do records and other media which put music into people's homes. That's where the real musical action is, where people live their lives and deal with their emotions and those scarey

subjective non-verbal experiences that society, by consensus, pretends don't exist, and which they hate artists to bring out in the open. Home is where people are often alone and need music.

I didn't want to go around like a trained monkey, playing a microcomputer live, being a novelty, or let concert producers exploit me — one told me, if I'd play on this series, he could kill two birds with one stone, getting both a woman composer and a computer on the series in one shot. I wanted to be able to do my best work, in my full studio, at leisure. Coincidentally, I'd just published those critiques of the alternative performance scene about the same time people started requiring that I play my Apple II live. So the '80s were pretty dead for my music: I wasn't performing, instrumentalists didn't play my scores, and so almost no one heard my music. I spent the '80s mainly involved in technology and software, studying and trying more new ways to create, and exploring logic-based intelligence that would let me go further musically, and enable even beginners to have satisfying musical self-expression. Late '85 into '86, I wrote *Music Mouse* for both of these ends.

Q: At that same 1981 Congress, you also remarked, "If you could get to work with the sound with the same kind of freedom that you have with a piece of paper, then that would be very good — but we're not there yet." With *Music Mouse* and the other programs you've developed, have we gotten closer?

SPIEGEL: Closer, but still nowhere near. *Music Mouse* is really direct, but that's different — an instrument for computer-assisted improvisation — though a composing tool, too, since playing and improvising are often part of the composing process. *Music Mouse* has its own constraints, which I chose to fit to my own aesthetic, my own musicality. This turned out to be rather controversial. People expected creative tools to be general purpose and neutral, like word processors, which don't bias your style or content. But an intelligent musical instrument — any instrument, actually: a flute versus a piano for example — has its own unique aesthetic realm and musical biases, and especially a new one made by a composer for her own use foremost.

Otherwise, mainly no. Most software is nowhere near as direct or immediate as a pencil. A keyboard has its own problems as a computer data-entry tool: You have to select each note, and its duration, articulation, dynamic, and instrument in a separate act, changing data-entry modes then waiting for the screen to redraw between them. If you decide to make some change — say, from two eighth notes to a dotted eight sixteenth — that's a bunch of operations, often even requiring replacing or rebeaming the notes. With a pencil, a quick little dash and a dot give you that dotted eight sixteenth, and the difference between write and erase is just which way you turn your hand. You have random access to everything on a big page where you can see a lot more context, and can scribble verbal notes, draw curves, or use your private shorthand of symbols. Also, a pencil isn't modal: You can specify instrument, duration, and pitch in a single gesture. Notation is a genuine, natural, evolving human language, and connotation and meaning change with context and style; I still haven't seen notation-playing software that even really knows what to do at a fermata.

I always wanted electronic music for its wonderful new possibilites, for what was different, unique about it, not to simulate the old ways. It can't really do that anyway. Doubling an oboe with a flute, to mask and make a sound a bit less bright — these kinds of things don't reproduce in computer simulation; and anyway, why bother when the real thing already exists? When electronic sounds try to simulate instruments, they may sound reasonably good when solo, but they don't blend the same, or change timbre the same over their registers or with loudness. It's stupid to use a whole new world as a simulator for one we've already got. But that seems to happen in the first stage of every new technology introduced: It's used first to simulate preceding successful technologies. I'm not sure why. Lack of imagination? Not really seeing the Thing In Itself?

There is a ton of software I'd like to write, but it's much harder for one person to develop software now. Lots of things have been standardized in complex, hard-to-work-with ways that limit the freedoms I'm after by their assumptions. There's a lot of benefit to standardization, but I think it's too early to have had so much of it

done. More musical needs have to be understood and technological possibilities known. But the whole MIDI era is one standardization.

In 1983, before I'd heard of MIDI, I tried designing a standard digital representation for music, for telecommunications, under a Canadian Department of Communications grant — you couldn't get funding for this stuff here. It was a project with British Columbia Telephone and Microtel Pacific Research to do highly intelligent, logic-based music-encoder/decoders to network by phone, to send music or even play live with people far away, and eventually to publish by phone. It was like MIDI in some ways, but I think a lot less limiting — with lots of descriptors for process, relationship, structure, for testing conditions, adapting to context; it wasn't just a note-level alphabet. Then just when we had a working prototype and first ANSI standard draft, suddenly there was MIDI. It beat us to the punch. You had to use it; everything on the market was overnight designed for it.

MIDI wasn't done as a proper ANSI standard. That requires several rounds of publishing and getting feedback from potential users before a standard is ratified. MIDI was designed by a small group of manufacturers and engineers behind closed doors. They didn't consult musicians or experienced computer musicians like me or Max Mathews, who'd tried many digital representations of music over the years. I don't think they cared about what was best for music or musicians, or tried to avoid creative limits. MIDI was simple, cheap, and foisted on us as a *fait accompli*: Here it is, standard and set, music's new language, its notation for the computer age.

Now of course, they've tried to compensate for its lacking basic stuff they'd never thought of, like being able to change the definition of an instrument as an integral part of a piece as it unfolds. They'd just assumed you'd only compose for unchanging, predesigned instruments, like for traditional wood or metal ones. Also, the information flow is one-way. Not making MIDI full duplex was idiotic — your computer sends notes to your synthesizer to play, but the synthesizer can't tell the computer when the notes have faded to silence or send back any other information. So many things were poorly thought out that it's really good that MIDI was kept low-level and simple, so it didn't do more damage. But there are now six different

ways to trigger a note; it's not really very standard after all; it's been stretched and stretched to try to fit real music.

I tend to be led by visions of possibilities, rather than "here's something – what can I do with it?" But the way most music software is designed today, the compositional process is reduced more and more to a capture-and-edit rather than an envision-and-realize process, where music starts inside you and then finds its way to becoming audible, as you pin it down to a zillion specifics. In that process, computers can be helpful in ways that haven't been getting attention. Capture-and-edit is very easy; it doesn't require much understanding of music's methods or of the psychology of creation, or the ability to focus imagination. Commercial software companies look at finished scores and ask "How can we make a screen that looks like this and can be edited?" instead of "How was what's written here arrived at? What processes went on?" So there's lots of software out for essentially, pre-chordal, pre-orchestral, Notre Dame-school technique: You're expected to enter, or record, a bass line from the start of a piece to the end, then go back and put in drums from start to end, then go back and other lines. You don't think like that if you're through-composing, dealing with the whole content of each moment while feeling your way to the next. This overdub model is ok for, say, a simple strophic song form with repeating rhythm and chords. But you have to have the entire harmonic progression memorized or written down on paper, in which case either it's pretty simple or you're composing on paper or working it out in your head first anyway. The computer isn't really helping you compose; its mainly just a performer or copyist.

I've tried overdub composing, on tape and with my own and others' software. That's why most of my software, including *Music Mouse*, lets you deal simultaneously with all the parameters across a moment. You have several voices, which can have doublings, and as many touchable controls as a computer has inputs – for timbral and compositional parameters like transposition, inversion, relative motion in different ways, type of harmony and a lot more. *Music Mouse* is my personal choice of a group of controls that work well together for me. It's enough to keep your hands full, so I automated some stuff by logic, like harmonization. It's not just scale templates, stencils. I put a

tremendous amount of thought into things like providing smooth transitions if you go from any octotonic chord to a diatonic one. I made the best compromises I could, to get the most musical output, but for my own taste, not trying for some universal aesthetic. So it's biased toward stepwise motion rather than large leaps, to sound traditionally melodic even when atonal. I chose to automate some things so you'd be free to play a larger number of variables altogether; you're playing all the orchestration in real time, plus all the notes. I want to work on the level of playing a full symphony orchestra plus chorus as a single live instrument. Before computers, the closest we got was the organ, where if you had both hands full of keys, you had to drop notes to change stops, and that's abrupt change, not timbral dissolve.

Bach would have loved these things, and I think he'd have been frustrated with the same aspects of the standardization which frustrate me. It's like they looked at an orchestra score and said, "This looks like a multi-track tape. I guess people do it the same way," then made it really hard to move between instrumental staves, but easy to move along one staff because it's like one track on tape. A lot of commercial software is based on unresearched assumptions about how people compose and orchestrate.

There's a tremendous need for composers to be more involved in the design of their own tools. I've chronically lacked enough composing time in large part because I didn't have adequate tools for many things I wanted to do musically. I've spent astronomical time writing software but still have light-years to go. But I have to compose how I want — not fitted into some format derived from a reverse-engineered finished score. I don't conceptualize musical time the way these current standards do, or the relationship of orchestration to pitch-time content either. You have to work around these things, and the way each brand of computer or synthesizer has set up its own control interface. My software is out for Macintosh, Amiga, and Atari, and they all have different jargons for basically the same graphic metaphor. Music has an incredible thousand-year accumulation of vocabulary for process and relationship; but you can't use it to communicate with your computer.

Q: Has the copyright for *Music Mouse* been resolved yet?

SPIEGEL: According to the Copyright Office, it has — finally — after more than five years of correspondence and phone calls. But it hasn't really been satisfactorily resolved because they've ignored the problems. The whole copyright system is based on the idea of one single composer creating something finite and fixed in form, then profiting from the rights to it. But now that artistic information can exist as software and is malleable, it's traveling around like folk songs, with everyone in its movement path able to change it a bit in some way for their own use, and then pass it on. Someone tries to circulate their visual art on a disc, and someone else might change the colors or draw over part of it and circulate that. Every time someone plays a MIDI file in a different studio, it will sound different; they'll have different synthesizer sounds and do a different mix, and maybe add or change parts. In the 20th century, composing has become more collaborative: rock groups, jazz bands, various kinds of improv groups. In the early days of compositional algorithms, you wrote a piece of software for your own use as a composer, to do a particular piece or a set of pieces. (Three of the four pieces on *The Expanding Universe* used the same algorithmic program, with different parameters.) Now, if one person writes an algorithm which generates music, a different person might use it, as with *Music Mouse*. I consider this a form of remote compositional collaboration. But the Copyright Office ruled in a way that failed to recognize the creative decision-making input of the computer program's author as a creative contribution to the final piece; they didn't go for a double-composer model when one of the creative decision-makers was a piece of software — or really, that software's author.

The entire set of divisions of labor in the creation of intellectual property is rapidly becoming so different from the old model embodied in the copyright law that at some point they'll have to deal with it. With the current law, *Music Mouse* had to be one of three things. Was it: One, a musical composition — open-form like Earle Brown or Pauline Oliveros do, a Laurie Spiegel composition? It was written up in many places as, "If you like Laurie's music, this will be a good program for

you, but if not, you'll be aesthetically limited in ways you won't like," or "Its music's always got Spiegel's personal stamp on it," or even "This is a Laurie Spiegel composition put out as a computer program." Or was it Thing Two, the same catagory as literature — to copyright the text of the actual computer program as a written text. This also stretches the limits, because if you wrote a program in PASCAL which acted exactly like my C language one, it wouldn't look at all the same on paper; it would be a completely different text, not necessarily even a translation. Usually they register computer software as text, and that's what they finally ruled *Music Mouse* was.

Q: Their decision was to copyright *Music Mouse* as a text, the same way a novel is a text?

SPIEGEL: Yeah. The third category, the one I'd originally applied in, and where I thought it belonged, was audiovisual works. That category started out with film and video, and was therefore incredibly biased toward fixed, recognizable, visual content, really underplaying the audio part of "audiovisual." This category had already been stretched to include video games, and there were already precedents acknowledging that the creator had some rights in works using output from them: If you turn on your VCR and flip TV channels, copyrights in all the stuff you tape still belong to the producers of what you taped; and if you videotape a Pac Man or Nintendo session, copyright to the game images on your tape still belongs to the games' creators, even though the images will be sequenced differently for different runs of a game. Now that's more like an Earle Brown piece or a jazz player's variation on a standard tune. That was the existing category I thought fit *Music Mouse* best; if you made an original work with it, there'd still be acknowledgement of some creative content determined by the composer who wrote the software — who told the computer just how to turn a mouse move into four-part harmony — versus giving complete rights to the music to whoever just moves the mouse. It's remote collaboration, sharing the creative process; I may never meet the end user, but it nonetheless is a collaboration when they decide that *Music Mouse* puts out stuff that goes the aesthetic direction they want to go and they

use it. They come up with their own sounds and their own final music, but there's some of me in there too. It's a new variation on the idea of "variations on the theme." There may be very little of me in when they get done, but it's still been formed quite differently from whatever they'd have composed without it. It's like a word processor which, if you were writing a play, would guide the dialogue or plot.

I really wanted to get the Copyright Office to acknowledge a need for a new class of works, which I suggested calling "generative works": intellectual property which generates other intellectual property, or at least contributes significantly to its nature or content, whether music, art, or text. This will increasingly happen layer on layer: Somebody uses a program writen by someone else, and it generates notes; then they run the notes through a program someone else wrote, which has its own editing logic or embellishes or adds style characteristics; then they record that, using sounds someone else sampled from yet another person's recordings or synthesized sounds someone else designed. The traditional divisions of labor for music just don't hold; you don't have just one composer in total control, then relatively passive performers, and audience. You've got combined authorship. Different people create sounds, software that can modify or edit music by specified aesthetic criteria, people writing algorithmic generators which churn out material anyone can sculpt, mold, orchestrate, and change as they please. Also, you've got recording-studio engineers who, really in many ways, assume a conductor's role — or way beyond in cases of producers like Brian Eno, who really uses the studio as a musical instrument in itself and a musician as raw material. The old model doesn't fit, and so we see increasing unfairness to artists who aren't being rewarded for their creative work due to an antiquated intellectual-property-rights system that's simply failed to keep up with what's really going on. The creative processes that go into a work are much more widely distributed, decentralized, and spread out among different people than ever before. New technology requires new, more varied, technical skills, and music's always been a very technical art.

Also, just as in folk music or jazz, much computer-based music may never exist as finished, finite pieces that can be held as private property; there may simply need to be a new socio-economic model to

accommodate communal repertoire, cultural common property, music that branches into variants, like folk songs do as they change over time and place. Some branches off of a piece of music data might be dead ends, once made, but some may become great landmark works, heard everywhere. Remember what Bach did with those simple folk chorale tunes? Or his transcendent transcriptions of how he heard others' works? Was he their sole author? No. How would his creative contribution be classified, rewarded, under our laws?

As the number of people who affect the content of that kind of ever-changing commonal music grows, it becomes impossible to analyze the creative content in percentage shares or quantify the value of any one individual's contribution. Linking a person's remuneration for creativity to their ownership of some Thing they've made may be an obsolete way to support creative work. The idea of music as private property just doesn't fit all music. Another economic support system, altogether different from the intellectual property idea, is needed.

The judgment to copyright *Music Mouse* as text just ignores such questions. But there is no way to absolutely identify a *Music Mouse* piece; they're all different, and its output can be processed and edited in infinite ways later. I never claimed it was a composition; I always called it an instrument. But it is "intelligent" and makes decisions for you to the point where someone who's, say, a filmmaker or a choreographer is able to do music for their own works. It's an enabler. If I make five-bucks off one copy sold, and its buyer can then land a big film-score job, though all they ever did before was sound effects — is that economically fair? Their job resulted from my 15 years' work on interactive composition, my personal investment in research and development. It's an instrument, but an active collaborator. *Status quo*, all royalties go to whoever finalizes a fixed-form sound composition, regardless of how many different people's creative decision-making may have gone into it. Not fair. Not realistic. Not supportive to creativity the way it's being done now.

Q: Has this experience soured you on developing other kinds of software for the marketplace?

SPIEGEL: The problems of getting distribution and providing technical support and database maintenance and such stuff have soured me enough that I'm not sure whether I'd want to do another program commercially, versus shareware or public domain. Public domain is attractive in some ways: You won't get anything back, but then people don't expect as much from you. It gets rid of all the problems of considering such creative works as "property." You have a lot more freedom — no drags like marketing, contracts, accounting, inventory. You can just upload onto a network, go on to other things, and people can like it or lump it. No one will demand their money back because it doesn't do something other software does. You still get feedback — like "I touched the Mouse and this sound came right out and made me jump; it shouldn't have done it; I hadn't started anything yet. It's doing stuff all on its own!" Ussachevsky's first reaction to *Music Mouse* — and I'm still not sure what he meant, though he clearly liked it — was "Thank God Stravinsky didn't live to see this!"

I honestly don't know. I'm very disheartened with the distribution systems for both music and software — that's the real problem. We're in a transitional period where information, which should be able to travel freely and cheaply as electronic or optic data, is still being distributed as manufactured objects, which keeps costs high to support a bunch of middlemen who control the means of object production, as though we were still in the kind of 19th-century economy Marx dealt with so brilliantly. We're locking informational value into a manufactured-commodity economic model, and thereby putting it through all the same bottlenecks: record companies, sales projections, profit thresholds — there are sales volumes below which it's not profitable to manufacture, package, warehouse, and ship music or software objects. To have to guarantee thousands of sales because data's being handled as objects is insane for digital information. Ways to distribute cheaply through wires or even air already exist. Profit thresholds for manufacture mean that minority creators can't get works into the market place or to their audiences. And those who want their stuff can't get it at all till a lot more people want it too. That's why I had to do concerts to build demand before I could do records.

Q: How much of this is simply the glacial slowness of bureaucrats in adapting to social and technological change, and how much is it a deliberate attempt to centralize and control the flow of information?

SPIEGEL: I think there's a lot of the latter, but not necessarily deliberate. It's more like intertia. Old paradigms and habits die hard. But the liberation of information from objects involves questions no one's answered; like how do you attribute value to information? Clearly, the informational value of a bunch of random digital garbage is different from that of the same number of bytes containing *The Art Of The Fugue* or a concise composing algorithm which can churn out an infinite amount of music. "e = $mc^2$" is just 7 bytes long, but its value's awesome. One of what I call Spiegel's laws, in this book on informational economics — which I've been not quite getting back to writing ever since Oxford — is that information tends to go where it's wanted and resists going where it's not wanted. (That's, of course, without the drag effect when information's forced to haul objects around with it.) The laws by which information gains and loses value haven't been explored. In Marx's terms, information has both use value and exchange value; but it also has other valuation properties. It can become obsolete. It has truth value, or a true-false quotient which can be perceived to change, and affects its value, though false info can have very high use value too. It loses value as it becomes more redundant — that's plain old supply-and-demand: Scarce information is very valuable. Then there's the question of control of access to it, ownership, secrecy, and things like our distribution bottlenecks — you know — record companies, publishers, broadcasters, libraries, data networks.

So besides not having criteria for determining information's value, we also don't understand much about the value of information-access control. And there are lots more questions: how context-sensitive information's value is, and questions like meaningfulness, which even Claude Shannon's brilliant information theory didn't touch. Information theory per Shannon and John Pierce, incidentally, is one of my great inspirations; it's been used in a lot of my algorithmic pieces — not *Music Mouse* but other works. People put too much emphasis on *Music*

*Mouse* because it's the only music program seen by the public. But I've written many others, some heavily influenced by Shannon's work, which was about optimizing communication, and gave me a way to impose dramatic emotional form onto algorithmic output. I've heard a lot of algorithmic music that's dramatically pretty flat. In contrast, I learned early how to vary informational entropy (that's essentially the ratio of the predictable to the unexpected) throughout a piece, to make drama and emotion by playing off of expectations. It's a variable I like to play live.

When you try to talk about changing how we attribute value to information, to creating, lawyers or the Copyright Office people just go pale and run back to the old ways, because, my God what do we do? They're not getting paid to do that level of thinking. I've talked to ASCAP and BMI house counsels and been told things like: When Muzak or some other zillion-dollar business starts using other people's algorithms to generate music, then there'll be enough bucks to bother with these questions, but not till then. "Then" may be too late. Maybe four years after I sent my copyright application for *Music Mouse* to Washington, the people I was dealing with said, "When this first came in, it was one of a kind and we put it aside as minor. But now we have a whole pile of stuff raising similar questions, and they keep coming in!"

Virtual Reality's another example of a technology where people not only forgot its history and evolution, they also don't want to think about its implications or full potential; so they make false analogies back to mid '60s LSD, which has nothing whatsoever to do with it. VR requires new thinking, questioning. The Big Powers - rights handlers, manufacturers — are scared we might have to scrap the old economics of creation, and go to a different structure, to change concepts like ownership of works or works as finite, unchanging things. We actual creators have less to lose if there's change. The current system just doesn't pay us. But we're still getting new travesties on the books, like this DAT-tax bill that just passed, which essentially taxes creative artists for making digital copies of their own works to distribute to fewer people than could support pressing a cd, with the tax revenue from the blank DAT tape going to the big record companies

which make cds. It's unfair, illogical; it blatantly puts the cost of supporting the *status quo* on the backs of the artists who suffer from it.

Q: With the seven improvised pieces made using *Music Mouse* on your cd *Unseen Worlds*, did you feel that this was exactly what *Music Mouse* is supposed to do, or was there more a sense that you've barely scratched the surface of its potential?

SPIEGEL: Those were just things I felt like doing at the seven moments when I did those seven movements. That is what the program's for, but there's plenty of other music it could do. I did edit them a bit digitally on hard disc, and do some digital signal processing, and I even went in and took out a note here or there. There are still things in them that bother me, where I'd like to have crossfaded to a different eq and back out or something, because there's a limit to how much you can control in real time. Also, in one place, a friend accidentally punched a 22-second drop-out into the master of one piece. I fixed it pretty smoothly — I don't know what prize I'd award to someone who found the place where I patched that up. Things like that happen and you just have to deal with them; but mostly they all just came out as they are on the cd. I do some thinking first, some planning; I don't just sit down and play. I have to decide the orchestration and starting set-up, and think about the processes available to me. As with analog synthesizers, I don't start pieces with everything running full blast. First I check out all the parameters that can be run full blast in a given orchestrational set-up, with *Music Mouse* as an interface, and what variables I can move, then I go back and pick a starting place, one that's simple and held back, so I have lots of room to expand in every dimension where I can move, so I can make build-ups, climaxes, overloads, tensions to resolve. There's a lot of pre-composition in that kind of improvisation. You have to know your instrument really well, and I like to try to make a different instrument, in some way, for each piece.

Q: There's certainly a wide variety among those seven pieces.

SPIEGEL: Though they're all the same technique — a pretty simple set-up: A 1986 Yamaha TX816 synthesizer (now obsolete), and Eventide digital signal-processing units I love dearly. Eventide's a company I've consulted for on and off in various ways, and have known well as good friends since the mid '70s.

Q: These pieces get into a strange rhythmic quality. You can feel that they're being played, but not in the moment-to-moment sound. It's the larger sense of gesture and compositional change which has the sense of a live musician.

SPIEGEL: Well, the instrument's meant to be played on the composition level, not so much on the note level. Or maybe that's from exploring each sonic space first, so I can start low, knowing in advance the directions I can go. This is something I discovered working with the Buchla and other analog synthesizers in the late '60s. You could set up a dense patch with a zillion things going on, and then take down one element at a time till it got very simple, maybe just a single steady sound. Then, in playing the piece, you knew what you could build toward, and could go several minutes, by bringing back up, introducing, all the stuff you'd pulled down. It's like you've clearly envisioned the finished sculpture buried in a rough rock before you pick up your chisel to reveal it more and more as you go. When you get something really intense going, you don't just say, "This is fantastic!" and push "Record." You think, "In what order do I want to reveal its different aspects? How do I want to build to this over time?" I also work at the harmony of the climaxes; harmonic cadences are very important to me still, synchronizing harmony and density with dynamics and timbre in climaxes. There's a lot of preparatory thinking and feeling out; it's not just spontaneous. I think most people who improvise have their own bag of tricks or pet processes; they don't start from absolute nothing each time. Preparation makes it easier to feel and act spontaneously, moment to moment, during the actual recording run. My feel for form is one of the things that always separated me from the minimalists, and made me slip through the category cracks. I tried and tried in the

early '70s to do drone music, but friends like Rhys kept telling me, "Laurie, you just don't have it — this is still moving too fast. Slow down and try again." I tried but I just couldn't. I come out of an unabashed love of many great masterworks of previous eras.

Q: Especially the Renaissance and the Baroque.

SPIEGEL: And the Romantic too — I also come out of Chopin and Beethoven and Schumann and Brahms. I love Shostakovich tremendously. But Bach above all. And some earlier ones: Dowland I think is very much underestimated; Machaut is fantastic — but then people do know that, if they know early music at all. Folk music and early European music both tend to be more process-oriented than form-oriented. You see the changeover right when Bach was culminating the processes of imitative counterpoint in *The Art Of The Fugue*, while the young Mozart and Mannheim school guys were working on sonata form and rondo and all those other fill-in-the-blanks forms. When a climax happens in pre- or non-classical — process-oriented — music, it builds more organically and naturally, because it's not an obligatory climax, like before a sonata's bridge back to its original key to recap its first and second themes. It's something that just happened at some arbitrary point, when it hit you to bring back the subject in inversion, augmented, in the bass, and you felt a chill go up your spine.

I got into composing grown up, after my values and preferences had already been formed by listening. For many years I thought starting composing so late was a horrible disadvantage, but it turned to be a real plus instead. I'd spent the first 23 years of my life not seeing myself as a composer at all, free to listen to music with no vested ego interest in any particular type of it, just enjoying it and finding out what I liked and what moved me, and getting my values clear. Then when I set about learning enough technique to be able to create music to fit my values, it was natural — in fact necessary — to explore, even invent, alternative techniques, because I was so far behind, age-wise, on traditional techniques. Starting composing late, I needed to find ways around my ignorance and lack of practice, in order to express in sound what I needed to, artistically. I didn't have time to just go the

slow traditional route of writing down a zillion notes on paper then waiting up to 40 years to hear them. I needed ways to do music that could be heard now, so I could learn faster and really communicate in sound. New techniques bought me time; I could work professionally in music while still studying hard to get some mastery of notation, keyboard, and traditional skills. I didn't get into the avant garde by trying to get even with — or rebel against — some childhood piano teacher who'd forced me to do music some artificial proper way. I ended up being called avant garde, an innovator, as a spin off.

Q: Regarding the unusual rhythmic nature of your pieces, it seems to me that what's coming out is not so much the physical rhythms of a performing musician, but more the rhythms of nature, the larger cycles of natural processes.

SPIEGEL: That's beautiful. Thanks. One thing music notation developed for was to fill the need to synchronize ever larger numbers of musicians, and those metric sync pulses became increasingly dominant over time. Early in notated music, rhythm was very free, as in mellismatic trope. The Renaissance was still extraordinarily diverse, rhythmically. By the Baroque, musical time felt a good bit more regulated, and by the Classical, it was uniform enough to feel boringly predictable at times. Then in the 19th century they began trying to break free; you find more rubato and tempo shifts and like that. In our own time you see the level of contrivance of Elliott Carter's metric modulation, which extended the notational system to give more precise control of tempo change, but which also let the whole sense of spontaneity music was trying to get back to somehow fall by the wayside. Graphical scoring, like Jake Druckman's, gave more rhythmic freedom, but often things went by too dense and fast to hear it.

When I played the guitar in my teens, or the mandolin I kept under my bed when I was younger, I never played against a metronome; I didn't read; I wasn't exposed to the tyranny of the bar line, which is like the tyranny of the clock. I just practiced self-expression. The music I've been concerned with is just for and of individuals, for personal expression and direct person-to-person communication. Maybe that's why

I never really got into chamber music or works for tape plus live players. Scripting interactions between players wasn't really of interest to me. I try to make very direct communication to listeners, and also to find ways to enhance other people's self-expression — like software with built-in expertise. Or I write pieces for reading at home — though I've also loved it the few times performers have played my written stuff on stage. I enjoy sight-reading a lot; I never bother to memorize anything, I just like to read and read. I like to write for people who enjoy doing this too, though it never gets published or to them. I'm very content-oriented, but I also love form and structure — otherwise I wouldn't love programming computers or Bach so much. I structured *Unseen Worlds* as a Hegelian dialectic: The thesis is intuitive, spontaneous, expressive stuff; the antithesis is precomposed, algorithmic, totally procedural and predefined; then the synthesis — the last work on the cd, *Passage* — is composition: some un-analyzable hodge-podge melding of those two extremes, different for every composer and at every moment while you do it.

Q: It's ironic that the procedural, composed pieces are the most familiar rhythmically, while the played, spontaneous pieces take rhythm into a very different area.

SPIEGEL: It's easy to predefine, to precompose, what sounds familiar, normal. It's the unfamiliar that needs the spontaneity of the moment — the freedom not to feel compelled to move a sound till it feels right, or when into something, to just keep going, to keep following it, moment to moment.

I have problems with most commercial music programs. They want to think of time in beats or ticks — though I did compose *Passage* in a sequencer. I never look at bar lines — I have to look past and through them. I felt immediately locked out as soon as I tried to use the notation program *Finale* — a widely-used Macintosh notation program, because its basic unit of music is the bar. When I booted it, I wanted to write unbarred music, an unmeasured prelude for a harpsichord commision a couple years back, and I couldn't get out of the bars! They

had me behind bars! You were forced to think in them. It was useless, an impediment. I went back to pencil.

When you're sitting out on the back porch with your guitar, after your parents have had some big fight, and you feel down and just play your guitar — that's where my music really comes from. You try to deal with the emotions you feel at each moment, feeling for the right next sounds. Sometimes you'll fall into something which will just catch and move rhythmically a while, but it's basically moment-to-moment. If you're making music for people to listen to instead, like a tape piece or cd, you're making an experience for them, and it needs to build and to take them somewhere, to move organically, naturally, through changes of view and perspective and color and feel, and through tensions and releases which give it form. It's one thing to improvise just to deal with your own feelings; it's another to honor and keep the trust of listeners who've opened themselves up, in their homes, and let something you've made take them over. It has to be right, trustable, safe, so they can let go and feel it as deeply as they can. You can't lay on them anything artificial, extraneous, harsh, or hurtful that would make them close off, pull back.

What you asked about rhythm relates to style. I guess I always wanted to transcend style. It was in the way — full of associations, connotations. If you're doing this or that style of music, you'll automatically turn off a whole bunch of people, be typecast — though you can also turn off everybody by not being in anyone's favorite style! I guess I just never needed to fall back on standard styles or forms, just to be open to where it feels like the music wants to go. That's key, that IT wants to go somewhere, all by itself — you just let it take over. Composing isn't really something you do by will, it's something that you let happen to you. If you try to coerce it into preconceptions, it can be very hypocritical and very shallow. You have to let music be itself, just open your sensitivities as much as you can to find a way to make it hearable; then, hopefully, some people, at least a few, will hear it with the same mind-set.

Even back in the folk-music days, I never was good about keeping steady rhythms or playing things straight. I'd always start improvising on tunes and go off, and I'd feel frustrated if I didn't get to do so.

It's as fluid as electronic information, music. I suppose starting out in folk music did influence my thinking on fixed, predefined pieces, which always seemed just a subset of music, and also started me out thinking of music as process more than product.

Q: How interested are you at this point in composing music away from electronics?

SPIEGEL: Very — and I always have been. I've just been discouraged because there hasn't been much interest. Mostly, I like writing solo pieces for people to just read and play for themselves. But Joe Kubera's been good enough to perform some of my piano pieces in concerts a few times, and that's been wonderful. He premiered four pieces at Merkin Hall in early '91, and Barbara Cadranel played my harpsichord piece around then too. So some of my keyboard stuff got heard. There haven't been more than a couple of performances my whole life of any of my classic-guitar pieces, though that was my own personal, native instrument, the one I learned music on and wrote for first. In many ways, I have more freedom with the electronic stuff, and I love it, but it's all that anyone seems to want from me. I've got notebooks full of staff-paper pieces, which by and large have never been heard by anyone. I did have a piece, *Hearing Things*, for a 27-piece chamber orchestra, performed — once. Other than that, there's been very little interest, though there's been positive response. My *History Of Music In One Movement* for solo piano has been performed maybe three times. It got boo'd as reactionary once, but people like John Cage loved it! In eight minutes it evolves through all the historical styles, without a single actual quote. It was incredible fun to write; I got to let myself feel each period of history, and its need to break out into the next period's style, to experience all those transitions from the inside.

People have this image of me as some "out there" visionary. But I'd be pleased if any of my music, in any medium, were just in print, publicly available. I have nothing out, nothing. Scarlet Records went out of business three months after releasing *Unseen Worlds*. The old lps are all out of print, and nobody's got a record player anymore anyway.

My written music just sits in file folders and notebooks and my tapes sit in boxes. Ironically, there are literally tens of thousands of copies of *Music Mouse* out there.

Q: Has any of the work done with it gotten back to you?

SPIEGEL: Oh yeah, I get stuff from users a lot. Although it totally ate me up time-wise, a really wonderful support network came out of it, spanning people doing all different kinds and styles of music. I've got a whole box of tapes sent me by *Music Mouse* users.

Q: Were you startled by anything you heard them doing, which you wouldn't have anticipated would be done that way?

SPIEGEL: Rarely. But sometimes, though there's more redundancy than I expected. The first time I heard it used with a drum machine, it totally knocked me out. It never, ever, would have occurred to me to try that; every pitch was mapped to a different percussion sound: To get an ostinato going you hit "a" for automate, and it starts generating patterns — that's been called its "instant Phil Glass mode." Trimpin played his 127 computer-controlled wooden shoes with it. That's certainly not one I'd ever come up with! And it's been used to run theatrical lighting, too. Tom DeWitt did a videocamera interface, so a dancer or someone in front of the camera could play music by just moving around; they'd be the mouse, and the music would follow them moving around. People have done lots of neat things with it, but it's an old thing by now — I wrote it in '85, '86. The best surprises were how valuable it turned out to be in music therapy, in hospitals and prisons, and for an incredible number of people who'd never played music before they got it but always wanted to — including disabled people who couldn't otherwise play music at all. I made it for myself at first, but then so many people started asking for copies that I had to start selling it. So these results were all unexpected.

It's pretty appalling that you can spend as much time and effort as I have composing music in this society, and have absolutely nothing available, and very few copies of anything that ever was available ever

got sold, since they were never really marketed or promoted. Composing really doesn't sustain itself economically, unless you teach it or sell your time to TV and film. But you can write one simple piece of software that's just a reasonably well thought-out, fairly obvious idea nobody's done before, and live on it for five years. It's crazy! One answer is that people's hunger to be able to make music is much greater than their appetite for new stuff to hear. A lot more people want to make music than know how to. Another answer is just that technology and software aren't called "arts," so the "intellectual property" is considered valuable — and you should be remunerated for creating, whereas music is something you should be punished for — being so self-indulgent as to be a parasite off of society by making it. It's OK to watch stupid old movies on television, but you should suffer if you use the same amount of time to write music instead. There's something wrong with this picture.