NUMBER 21 $2

MUSICWORKS

VID INGELEVICS

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SCORES WANTED
FOR MUSICWORKS LIBRARY OF SCORES

Lately, we have been thinking of strategies that would clarify and strengthen MUSICWORKS' representation of Canadian new music; the MUSICWORKS **Library of Scores** is one of the results. It satisfies a number of needs, one of them being a larger and more continuous input from music-makers in CANADA.

The MUSICWORKS **Library of Scores** (score = any notation; note, word, drawing, photo, map, ... ; that is meant to be played) will be established over the next three months with the submission of THE MOST RECENT COMPLETE SCORES by as many composers in Canada, of any age, any genre, who will contribute. The Library will be kept current by composers continuing to send their scores as they are completed.

The MUSICWORKS **Library of Scores** will function as a permament resource of items for publication in MUSICWORKS. Scores will be published in conjunction with specific articles or themes, and will most always appear IN THEIR ENTIRETY to facilitate a more indepth understanding of their composition and notation systems, and to provide an opportunity for performing musicians to locate some very new music that they might not otherwise have access to.

So, if you are making music and notating it in any way, send your complete scores to the MUSICWORKS **Library of Scores** so that we can publish them.

Keep a lookout for news on MUSICWORKS cassettes.

LETTERS

I was pleased to see the form my lengthy conversation took in the spring issue of MUSICWORKS (no. 19), though, as I see it, I would like to correct some misconceptions. Although both Danny Lepkoff and myself have been involved in the practice of Contact Improvisation in various ways and Danny clearly identifies one of the sources of his methodology in working with sound as the focus on sensation that both Contact Improvisation and release work promote, our work together on voice and movement draws from the many sources mentioned in our talk, and not primarily from Contact Improvisation. Also, as far as I know, Trisha Brown has not been involved in the practice and development of Contact Improvisation.

Your publication is visually stunning and in many ways provocative. Thanks for the good works.

Lisa Nelson.

MUSICWORKS

THE CANADIAN NEW MUSIC PERIODICAL

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Letters and unsolicited manuscripts for publication are welcome, and will be returned upon request. We would like to hear from you.

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UDO KASEMETS

AS A MATTER OF SOUND

AS A MATTER OF SOUND think of the concept of vico's new science.

VICO'S NEW SCIENCE: corso - recorso: cycles of life.

CYCLES OF LIFE — four ages: heroic, vulgar, chaotic, divine.

DIVINE AGE: men believed gods spoke through thunder and lightning.

THUNDER AND LIGHTENING — language of signs and symbols, sages and shamans

SAGES AND SHAMANS: poets and artists of divine age.

DIVINE AGE: the age of magic and mystery, mute mime and music.

MIME, MUSIC, chanting, dancing preceded speech and writing.

SPEECH AND WRITING: tools of kings, nobles, priests, poets of heroic age.

HEROIC AGE — the age of aristocrats, autocrats.

ARISTOCRATS and AUTOCRATS made laws for church and state, rules for art.

ARISTOCRATS' RULES FOR ART were not changed by democrats.

continued...

COUNTERBOMB RENGA

There is a subtle process, called COUNTERBOMB RENGA in motion across the land. It is about to turn public in early 1983. In order to shed some light on this activity I talked to myself.

Speaking of COUNTERBOMB RENGA...

Let's take one thing at a time.

Alright. Speaking of renga.

Renga is a form of collective poetry, cultivated in Japan primarily between the eighth and the seventeenth centuries. It was very rigidly structured. Short poetic statements of 17 syllables — arranged in groups of 5, 7 and 5 (also known as haiku) — were alternated with statements of 14 syllables — arranged in two 7-syllable groups. At least two, but mostly many more poets took turns to provide the successive links.

A poetic group therapy or jam session?

Far from it. Much thought, discipline and sensitivity had to go into making not only the miniature poetic statements themselves, but also into how the linking was made.

How?

The basic rule was: any given link had to form a poem with that which preceded it, but this poem in turn had to be different from that which it formed with the link which followed it.

So as in any chain the cumulative strength of it depends on each individual connection: the chain is joined link by link, each link, though independent of any other links save the immediately adjacent ones, contributes to the total firmness of the chain.

Yes. But there is more to the renga than just its structure. In the words of the great renga master Shinkei (1406-1475):
"The art of renga is not the art of composing poems, or verses of a poem, but a spiritual exercise to penetrate the talent and vision of another. ———All the arts are composed only of that which one translates from the heart of things into one's own heart."

This chain-like one-to-one linking of intellectual and spiritual energies results in art that is at once extremely intimate and broadly universal.

That's why renga-making in Japan was a whole vital poetic activity — with its ups and downs — for a whole millenium, and also why it has transcended cultural and age barriers by surfacing now in the west in many guises.

Aren't cross-cultural transplants suspect? Isn't often only the form adopted and the essence missed?

In the case of renga it is just the opposite. The two greatest western rengas composed so far have the spiritual strength of any of the classical rengas whereas their structuring — although as tight as the idiom demands — abandons entirely the Japanese tanka pattern.

Superimposed image: detail of ***Picture Score for Inspiration: Markings number 1*** *by Suzuki Akio.*

DEMOCRATS changed the
laws of institutions and
vulgarized language.

VULGARIZED LANGUAGE meant the
demise of poetic speech.

POETIC SPEECH was
buried with heraldic art
and ritual dance.

RITUAL DANCE gave way to
ballroom dance, common music.

COMMON MUSIC of
no magic, no mystery —
cheap entertainment.

CHEAP ENTERTAINMENT — a sign
of the times of vulgar age.

VULGAR AGE: child of
industrialization,
urbanization.

URBANIZATION: loss of
rural roots, touch with nature.

LOSS OF RURAL ROOTS,
TOUCH WITH NATURE — cause for dawn
of chaotic age.

CHAOTIC AGE — entropy
of all communications.

COMMUNICATIONS
revolution; silicone
chip, electronics.

ELECTRONICS — door to an
invisible micro-world.

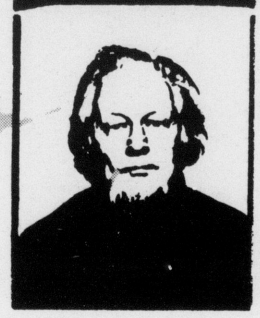
AN INVISIBLE
MICRO-WORLD operating
at enormous speeds.

ENORMOUS SPEEDS presuming
altered sensory systems.

SENSORY SYSTEMS
now are still tuned to rhythms of
industrial age.

RHYTHMS OF INDUSTRIAL AGE
reflected in rock and punk.

continued...



We are speaking of the 1969 Paris renga of Octavio Paz, Jacques Roubaud, Eduardo Sanguineti and Charles Tomlinson, and the recently published ***Themes and Variations*** *of John Cage.*

The former is a quadrilingual (Spanish, French, Italian, English) renga using the sonnet form as its basis and a permutation system to determine the sequence of the writers. The latter is a tribute to fifteen thinkers and artists whose influence Cage acknowledges through a renga which integrates statements on 110 subjects chosen by chance operations with Cage's favourite mesostic structure.

We could go on and on about both the ancient Japanese and the present western rengas, but let's talk about COUNTERBOMB.

In his widely discussed book, THE FATE OF THE EARTH, Jonathan Schell makes this much quoted statement: "Two paths lie before us: one leads to death, the other to life." We have to choose, he tells us, between an imminent holocaust or a complete abandonment of nuclear weapons. In order to reach for the latter, we have to — he quotes E.M. Forster — "Only connect!" COUNTERBOMB is a network of such connections where pooling of intellectual and spiritual forces will create a force considerably stronger than the sum total of its parts.

In other words, COUNTERBOMB works on the same principles as a nuclear bomb — a chain reaction causes explosions of immense consequences — only here it's the power of words to demand peace rather than physical power to sow death and destruction.

The renga concept works ideally toward this purpose. Ideas are absorbed and elaborated upon, packaged tightly and then handed to the next participant for further involved treatment, and so on and on, until an unbreakable chain has been tied together.

So we are speaking of COUNTERBOMB RENGA...

In order to get this process started, I read through the third part — THE CHOICE — of the aforementioned Jonathan Schell book and composed acrostic poetry making a renga. The first acrostic was made around the words THE CHOICE: Words starting with the letters, T, H, E, C, H, O, I, C, E, in the order of their appearance in the text, became the backbone of the acrostic and were complemented by words in their immediate vicinity. The first acrostic reads:

after That
the History
of the Earth

Civilization
Human world
the marvels Of evolution
In spite of all we have learned
this entire Creation hostage to nuclear destruction
at Every moment

Then the last words, EVERY MOMENT, became the vertical spine of the next acrostic, the final words of it the core of the following, and so on to the end of the book, the final acrostic reading:

making ourselves
the allies of Life
It will be soon
we put aside our Fainthearted
Excuses and cleanse the earth
of nuclear weapons.

This is purely a solo renga, all culled from one text, and far from being an accumulation of many voices.

Sure. On the one hand it is a private and personal confrontation with the form and subject, on the other it was meant to become a starting stimulant for other participants. There were all told 43 such acrostic links. Each of them was entered into one of the 43 notebooks of 25 pages each and recorded on one of the 43 cassette tapes. Then 40 of the matching books and tapes were mailed to 40 different poets or poets' groups in Canada, the U.S.A., Europe and Japan with the invitation to pick up the idea, compose their own links and move on to others to thus continue the renga process.

If all 40 notebooks were filled on all their 25 pages, we would have a renga of 1,000 links.

That's the idea. It corresponds with the historical Japanese practices: in 1313 a renga session in Kyoto produced a renga of 1,000 links; in 1391 and 1394 two rivalling renga masters organized rengas of 10,000 links each, and from 1433 to 1444 a yearly renga session was held in 20 different places to each produce 500 links of renga.

But considering present-day postal service and people's harassed life-pace, there isn't much hope that a complete 1,000-link renga would emerge from this effort.

Certainly not. But in this case we are not thinking of a final product of a fixed renga but an ongoing process that takes its energy from the renga principle and continues until the ultimate goal — nuclear disarmament — is achieved.

But if this chain isn't linked end to end, its force remains unused, the individual energies put into it disperse: the whole effect becomes entropic rather than explosive.

Therefore while the antibomb renga-making follows its own course, we also generate situations where the words written will be read, the poems spoken will be heard, the sounds imagined will be made.

Publications. Performances. Broadcasts.

The next issue of MUSICWORKS will be a complete documentation of the COUNTERBOMB RENGA project as it has developed from its gestation last spring to New Year's Day 1983. It will feature all the circulating poetry returned to its source by this time and all the musics — yes, musicians were invited to participate in this project by writing or recording monodic renga-chants — for realization in the further states of the renga.

Performances. Broadcasts.

A public performance of the poems read aloud or replayed from prerecorded tapes — as many poets' voices as possible — of musics recorded, or scored and realized on location, of artists interacting with artists, concerned youths, with survivors of Hiroshima and Nagasaki, is in the stage of planning and is tentatively scheduled for March, 1983.

Broadcasts.

The CBC will record the performance and assist in establishing a network of real-time readings of COUNTERBOMB RENGAS from coast to coast.

Peace.

Peace.

SUMMER SOLSTICE

BASIA IRLAND

At 5:23 am on June 21, 1982 the dawn was heralded in by a surprisingly wide-awake crew of conch-blowers at Damrosch Park, Lincoln Centre, New York City. Welcoming the sun by blowing hard into the sliced-off end of a conch shell takes a lot of breath, and after half an hour of pacing, most participants had settled into their own niche on the stage. Until mid-afternoon an assortment of musical groups, sound poets and artists performed on the stage and throughout areas of Damrosch Park during the Summer Solstice Festival which has been organized for the past ten years by Charlie Morrow, under the auspices of the New Wilderness Foundation. The solstice occurred when the sun reached its northernmost pinnacle at 1:23 pm. With the sun directly overhead, the Grand Conch Chorus was on stage with forty or fifty people blowing, drumming and dancing.

Invited from Canada to participate in the day's activities were the Four Horsemen, the Ensembles of Cape Breton violinists and myself. Sound poets, Steve MacCaffery, B.P. Nichol, Paul Dutton and Rafael Barretta Rivera of the Four Horsemen performed a series of pieces on the stage. Hearing and viewing them at that distance was quite a different experience from the previous day at Brentano's Book Store when the Horsemen had performed for an audience which sat several feet away within spraying and spitting range. MacCaffery had originally met Charlie Morrow in Toronto during the Eleventh International Sound Poetry Festival in 1978. This was the Horsemen's second year to attend the Solstice in New York.

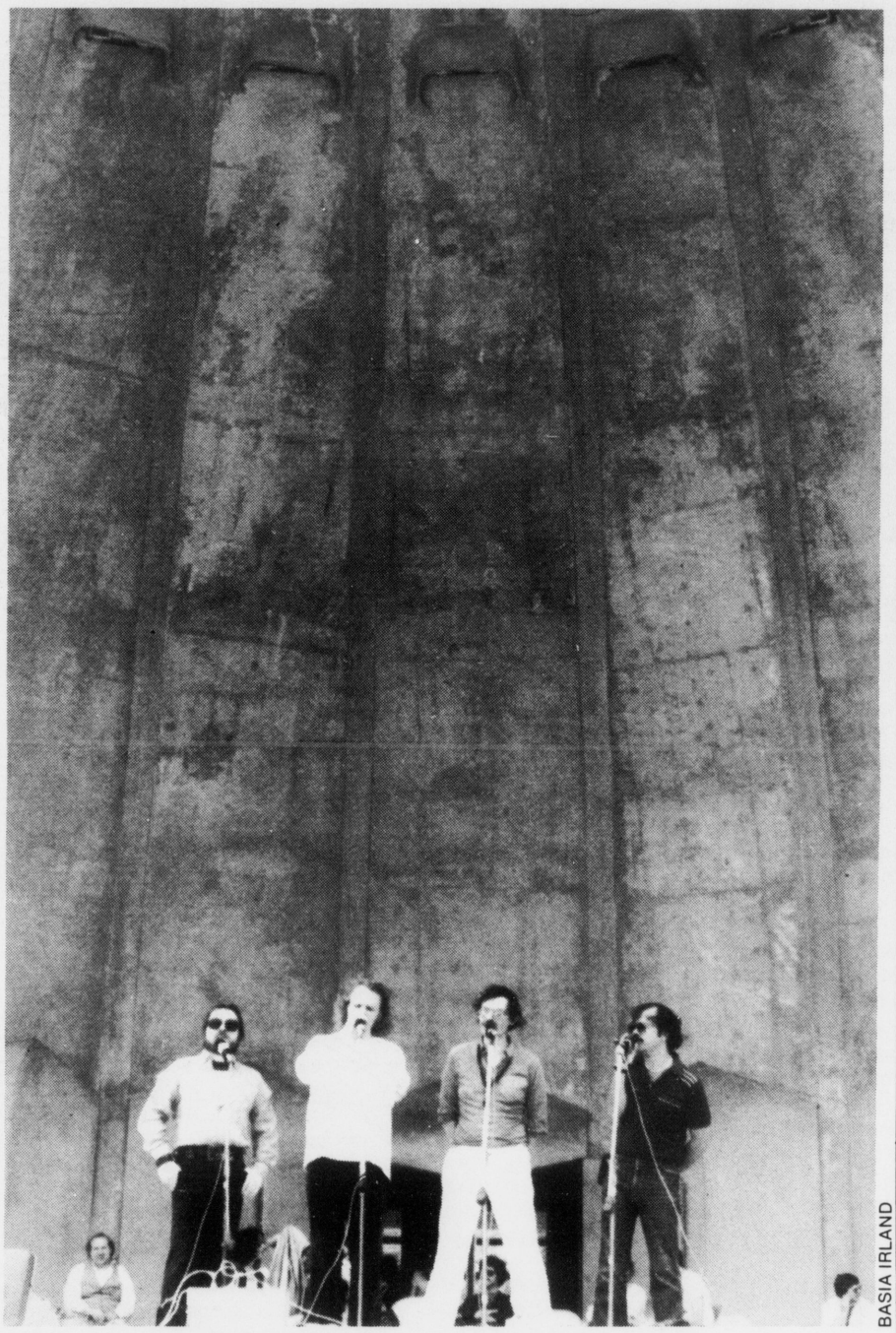
The Ensemble of Cape Breton Violinists, lead by pianist Joey Beaton, played traditional music native to their area. The foot-stomping sounds of this seven-member band added to the celebrative air of the day.

My own involvement with the festival came about through a suggestion from Robert Handforth, Assistant Director of the 49th Parallel, Centre for Contemporary Canadian Art in New York, that I contact the New Wilderness Foundation. Not being familiar with this group of experimental musicians and poets, I mistakenly conjured up images of some Sierra club offshoot. I learned about various events the foundation organizes through discussions with Carole Tuynman, editor of **Ear Magazine**. Most of these festivities, such as the Wind Event are cooperative efforts with Morrow as the catalyst. In the New York Times review entitled *Druids' Mark Solstice Euphoniously*, John Rockwell wrote that "Mr Morrow's celebration may be musical but more than that they are communal..." For several years the Summer Solstice Festival was held in a wooded area, but as funds became more scarce, the decision was made to move to a more visible urban setting, hence the event's present location at the Lincoln Centre.

For the solstice festivities, I designed a participatory work entitled **Rites of Passage**. This consisted of two seven-foot high light-weight aluminum structures which were bound with various materials. They were named after the two astrological symbols between which the solstice occurs. "Gemini" was yellow, wrapped with bamboo, sticks and star charts. "Cancer" was shaggy bluish-purple and white with pages from the ephemeris suspended from five points. Both of these structures, which were mounted with star-shaped domes, could be lifted and moved about from within by participants.

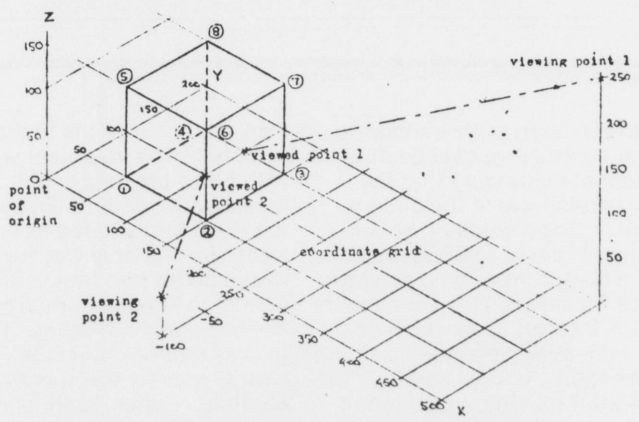
A sampling of other events occurring during the day were poet Alison Knowles reading a text in a tree accompanied by Tuynman and Morrow on trumpet and free style improvisation groups which settled into areas around the park. The majority of the participants were from New York's "downtown experimental arts community" as Rockwell phrased it. But the events expanded far beyond the city during the International Radio Broadcast between 1 and 2 pm with live performances reaching New York from Dalhousie University, Nova Scotia; Nassau, Bahamas; New Zealand; Sweden and various points in the States. This event was rebroadcast by David Jaeger on the CBC program **Two New Hours**.

Even though the morning had been overcast, there was a cheerful, lighthearted feeling of celebration about the activities. New York artist Donna Henes had given people red streamers upon which they could write peace messages in different languages. These were fixed to a tree and then cut-off at the end of the day leaving behind only red knots as a reminder of the day's activities and the sense of community which had been established among the participants.



BASIA IRLAND

The Four Horsemen.



Method of determining the three-dimensional co-ordinates of points defining an object by means of a co-ordinate grid.

GRID ERA is a performance based on the rise of visibility of Grid Patterns in Contemporary Culture. The threshold of visibility of the Object in Culture (visual pattern/sound pattern) is traced — dissolutions and origins are explored: A projection is projected; a flexible grid is made, then folded up and taken down; a Planar, clear grid is hung in the air and objects are modelled on it — location points are established; A grid is illuminated by the City; A new medium (computers) is introduced; The grid of Culture is shown; The grid is dissolved as structure and presence by taking off various layers and shown as 'Gridiron' in a dark bohemian cultural-village.

ARCHITECTONICS IN MUSICAL SPACE

CAMPBELL FOSTER

What is the common experience of the Architectual space and Musical 'space'? The message of The Music and The Buildings goes necessarily beyond words. There is an *Interface* to the human body. With Buildings it is the natural, physical and spatial interface to the body — the partitioning is achieved on a conceptual level. Dance music must motivate the body in a sensible and synergetic manner: Utility buildings/Utility music.

If we consider consciousness to be a point; that point is essentially instantaneous with the experience of consciousness moving through time. In relation to our own experience of time, we cannot classify Architecture with the Time Arts (Dance, Music, Film; involving time as an immediate element). Barring Time and Movement, a Building inherently displays an 'infinite point' simultaneously of the object in space. A point moved in space produces an infinite number of points, or a Line. A Line moved in space produces a Plane. A Plane moved through space produces an infinite number of planes, or a Volume. The 'infinite point' simultaneity in music becomes attention or consciousness.

Unhampered by the boundaries of physical space, sounds exist in the undifferentiated void of 'concept'; seeing without seeing, hearing without hearing; the blind. A repeatable set of symbols arises from the root elemental structures which have originated from the grouping, (re: Learning) and economizing agents of the perceptual process. Intuition derived from the human body's experience of physical space is applied to the art form. These a priori experience and programmatic considerations are brought into the listening and viewing environment.

The infinite non-mass of Consciousness — the impenetrable statis of Matter. Between this is the human being, free to move in space. Matter can be transformed to approximate Spirit through the creation of Art. This is justifiably a manifestation of the internal environment through external reality.

In Design, the process of conceptual division and structuring is requisite in both music and architecture. The basis of these similar propositions is not content (types of steel, glass, materials, or musical instrumentation, violin or viola, or written historic notation artifacts), but the perception of Forms. The intuition of the experience of the human body in space gives rise to elementary conceptual forms which function as grouping and economizing agent to the perceptual process. It is the perception of the gestalt (Tenney) of forms through the intuition of movement in space which is the shared experience of these arts. In auditory space: a world of concepts, forms and process, defined by the partitioning of consciousness and perception in the sound environment. In Architectural space: a world of concepts, forms and instantaneousness, defined by the partitioning of consciousness and perception in the solid/space environment.

ROCK AND PUNK: screams of frustration of not knowing where we are going.

GOING nowhere: we are in the midst of chaotic age.

CHAOTIC AGE in government, economy, media and arts.

MEDIA AND ARTS in new guise to mask old attitudes.

OLD ATTITUDES to prolong the agonies of the chaotic age.

CHAOTIC AGE to birth a new viconian cycle.

A NEW CYCLE born in nineteen forty five in alamogordo.

ALAMOGORDO: a new burst of thunder and lightning.

THUNDER AND LIGHTNING — unleashed by man but never before known by man.

NEVER BEFORE KNOWN BY MAN these voices of a new age.

A NEW AGE — ruled by immense electronic speeds, nuclear forces.

FORCES as awesome as those feared by ancient humans.

ANCIENT HUMANS learned to know the ways of nature by starting from scratch.

STARTING FROM SCRATCH, sages and shamans of old searched for truth.

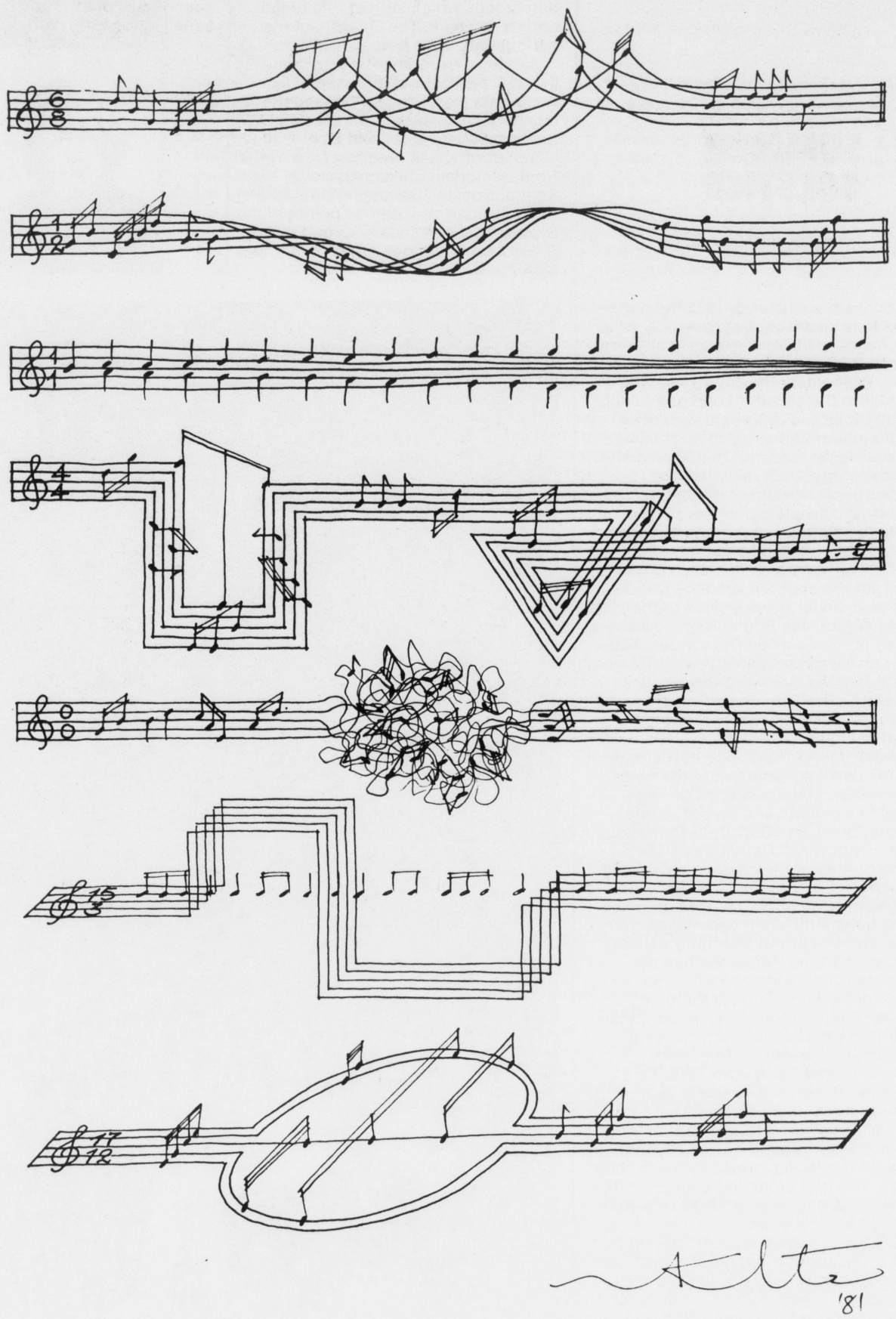
TRUTH in our time is found by sages and shamans by starting from scratch.

STARTING FROM SCRATCH: asking for new answers to new questions.

continued...

NOTATIONS

NOBUO KUBOTA



My favourite activity is inventing. An early arms control proposal dealt with the problem of distancing that the President would have in the circumstances of facing a decision about nuclear war. There is a young man, probably a Navy officer, who accompanies the President. This young man has a black attache case which contains the codes that are needed to fire nuclear weapons. I could see the President at a staff meeting considering nuclear war as an abstract question. He might conclude: "On SIOP Plan One, the decision is affirmative. Communicate the Alpha line XYZ." Such jargon holds what is involved at a distance.

My suggestion was quite simple: Put that needed code number in a little capsule, and then implant that capsule right next to the heart of a volunteer. The volunteer would carry with him a big, heavy butcher knife as he accompanied the President. If ever the President wanted to fire nuclear weapons, the only way he could do so would be for him first, with his own hands, to kill one human being. The President says, "George, I'm sorry but tens of millions must die." He has to look at someone and realize what death is — what an innocent death is. Blood on the White House carpet. It's reality brought home.

When I suggested this to friends in the Pentagon they said, "My God, that's terrible. Having to kill someone would distort the President's judgement. He might never push the button."

Roger Fisher
Bulletin of The Atomic Scientists

HOW TO MAKE 2 SOUND EFFECTS

1. Using a Guillotine

"I used to have a whole lot of fun. One of my favorites was a guillotine. Max Ferguson taught me. Lucky my studio had an old lino floor and one of those hard abestos walls with holes in it, for the sound: acoustic tile sort of stuff. Anyway, you get one of those old secretary chairs on wheels, and you get one in the studio, and you mike the far wall, and you sling this thing across, and it goes rrmrmrbmrmbrmrmrbmrm SMACK! ... and, you speed that up a bit, tidy it up, and it's beautiful. It's really nice."

— Chris Stone of Chris Stone Audio talking to John Oswald.

THE VOICE IS IN YOUR BODY

FRANK BAKER

The following are Frank Baker's notes for the opening of his August 1976 voice workshop.

The voice is in your body.

That means the inside of your body.

Front and back.

You will see people singing, their mouths are moving. You will think that is the secret. Exaggerated movement is probably wrong.

The sound is made behind the lips.

The prevalent idea is to press forward. This is a false impression. The sound is made in the throat, which is not forward.

The original sound on the vocal chords is a mere buzz. As the sound goes through your body, the shape of your body makes the different sounds. It can change instantly. The shape can change, but the sound remains the same.

The tone is not only in the front of the body. Examine what actually happens. Stop pushing! You have control of your muscles in your mind. You have to know what you want.

In order to find out what is possible you have to experiment with no fear.

We are taught to be careful. The idea seems to be that what we do naturally is automatically wrong. So you have to be careful. We have to notice how things work naturally. We don't have to learn anything. We have to allow our bodies the chance to function as it was created to if we take away all the wrong things. What will be left will automatically be fine.

We create things by noticing them.

It's hard to realize that everything that we do is in our minds first.

Nothing exists in my body by itself.

When you sing you are imitating sound, the sound that is in your mind. It seems to follow that the back of your head is where the sound originates.

It takes patience and serenity to discover what lies in our brains. This seems like magic because we have no word for it. It's like memory. There is nothing really original but sometimes a truth (it seems like originality because it is drawn from the original source). Your head contains the idea of everything, your body can carry out those things if not interfered with. You must not start singing until you know what you are going to sing.

The truth of the matter lies in your brain not in your voice.

The voice is susceptible to the slightest thing in our mind, nothing excepted. A person's voice is a mirror image of their thoughts. There can be no interference to the passage of the thought to the voice. It was created that way. Of course this fact can be totally screwed up, your voice being employed to conceal and isolate. Even if you are trying to conceal and isolate with your voice, what you are trying to conceal can be heard by someone who has learned how to listen. The corrections are not made in the voice, they are made in the head.

To correct some interference you must find out for your satisfaction where the trouble lies in your body.

You must be aware of what's happening in your body.

Stillness.

All during the day we make extraneous movements with our bodies and our minds. We are usually not aware of these movements and only become aware of them when we take a moment to be still. Our movements are at our command. The movements happen after we think of them.

In order to find the source of these movements and pluck them from our repertoire we need to become still and watch ourselves.

You can't conquer this feeling in one instant. You can entertain it but your body will have acquired many habitual movements which seem at first glance to be natural. It is very painful to have to discard something that you consider part of your personality but when you consider what it is then you can see that it serves no purpose. You can ask yourself why are you doing it if it serves no purpose.

Many of our extraneous movements are ways of avoiding something we are afraid of. When we look at the fear that we are hiding from, we often see the fear dissolve, just by seeing it. Many times you would think of starting the tone with a word. You can not *say* any word with the voice. You can only say a sound. This fact, never mentioned, is the cause of most of the trouble in singing and speaking. Our education is all through the eye. Your eye can read much faster than the mouth can speak. Speech is the truth, we sometimes do not speak the truth. We only indicate that there is truth. There is no connection.

Our body knows how to do anything. You must think about what you want it to do and not think about how to do it. The body will know how to do what you want if you give it the authority to do so. It's very very simple. Our bodies will do anything.

We must not allow ourselves to think that our body has a separate life from ours. In death we see what the body is without us in it. What leaves in death must be the thing that does the singing and speaking. What is missing is the most important thing, not the body — but some other thing. And that is what we are trying to deal with. Trying not to mess it up with words and names. We're trying to follow our own sense and not be governed by heresay. It's heresay which causes the interference that gets in our way of being all that we can be. It is this interference which needs to be plucked out in order for our true selves to come through. The interference or heresay leads us further and further from the truth until what is left is like death.

Our voice lies in what seems to be the back of our bodies. A lot of things seem to make all sound We try to sing and speak, not where it is, but at the result. We try to make the result before the cause. We only think of our body as a front — no back. Our attention seems forward, in front of us. I think it should be on what's inside us. Where the thing seems to be is based on the vibrations of our bodies. Our bodies include everything not just the mouth or the lips, those are the last things to occur in the sound. The sound has a front and a back. Loud and soft are misunderstood. Soft is not less than loud. By putting your hand on the back of your head you immediately get a better tone. This is because you become aware of your back. We are hardly aware of our whole bodies, we usually only notice our hands and face. Our face is the last thing involved in the sound. If the expression on your face is wrong, try to find out what causes the expression on your face. You may think it's natural, it is not.

The word projection is very disturbing. The tone in itself speaking or singing is naturally projective. You do not need to make it go anywhere any more than a bell needs to move. When you are singing loudly or speaking loudly you must not shut your ears to it. We have been trained to not make any sound so it is offensive to you. You must enjoy your sounds and let your body contain them because it's the inclusive ins and spares in the body which make the noise. We are trained to hear only a few sounds. When we study the voice we still only hear a few sounds. We must go miles further because it's all there.

When these things occur the result is very loud, being free. Be sure that you are not habitually holding back. Loudness and softness are qualities of equal importance.

Loudness means you're letting it be what it is. Everything you do is appropriate for the time. If you want to crescendo you want to crescendo in your body so it seems to be getting better and better.

There's a right and wrong to life but life doesn't start from outside but from inside. The result is like a lightbulb of your aura. It doesn't go anywhere, it starts right where it is and stays there. Your consciousness hears it getting louder because you want it to. Don't close your eyes and mind when it gets louder but keep it open so you can enjoy it too. It shouldn't be the ultimate effort to sing loud. It shouldn't mean that. We tend to push the loud tone away from us. It should be more in the nature of pulling toward us. More and more it tends to vibrate. You are intimately associated with the tone. You glow and then the sound is everywhere. It has no direction. It stays where it is and gets louder there. One way of looking at it is instead of singing louder you are singing more beautifully. More beautifully seems to apply to natural things. The same feeling comes when you watch the Grand Canyon or the sparrow's feathers or a centipede. It seems to me that when one gets it, it can either be louder or softer. It seems to go past the idea of speaking into its aura, which is the next thing after enunication. We can pronounce what is necessary and everything will be perfect, but it will be dead. The beauty of singing and talking is what happens after pronunciation is accomplished. Since you are the boss you must conceive of it or it won't happen. Things "go back" because that is where the machine, which is our body, is located. The tendency is to push forward, to push out of the machine.

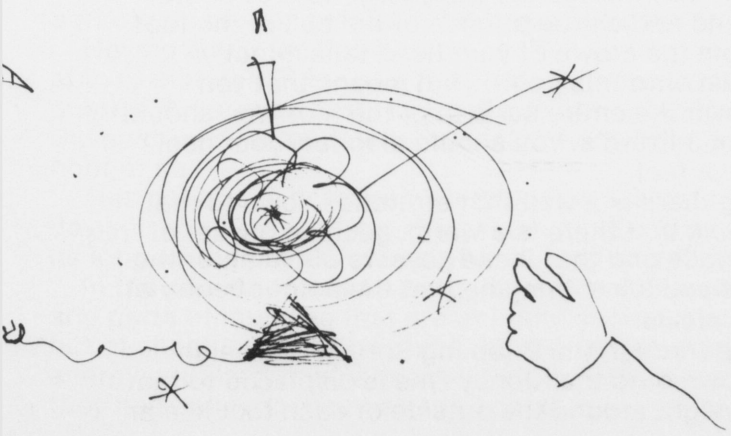
I'm not trying to make good English. If you have to read it several times to understand it I will be pleased. There are things that come to my mind just as they come. The thoughts come from watching. I can see somewhere in your body is the idea of what you want it to do but you are using the wrong muscle to do it. If you are willing I can tell you by watching you what you are doing wrong. Many times you are moving unnecessarily. Remember you are dealing not in dance but in sound. Most people cannot bear to have me tell them what's wrong. These people don't think for themselves.

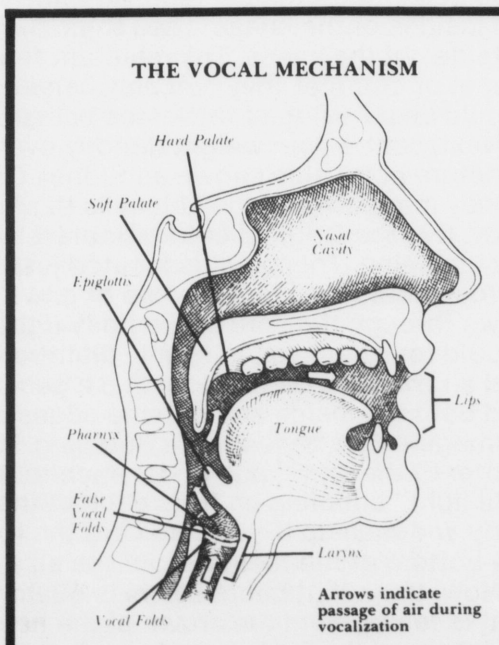
Frank Baker has been teaching voice for over forty years. He leads summer and winter workshops and is on the faculty of Bennington College. For more information, write to him care of Bennington College, Bennington, Vermont, U.S.A. 05201.

2. Tearing the Propellers off an Airplane

— produced by jamming a sheet of metal into the whirling blades of an ordinary electric fan.

— from **Illustrated Radio Effects** by Benville Snie





VID INGELEVICS

NEW QUESTIONS in a
new language invented by
sages and shamans.

SAGES AND SHAMANS of the
emerging new divine age.

NEW DIVINE AGE: humans
awakening to a new
awareness of life.

A NEW AWARENESS OF LIFE:
heightened sensibilities.

SENSITIVITIES
cultivated by looking,
listening anew.

LOOKING, LISTENING ANEW:
rediscovering sound, light.

REDISCOVERING
SOUND, LIGHT, their motions in the
einsteinian age.

EINSTEINIAN AGE: coming
to grips with the speed of light.

SPEED OF LIGHT is the
divine measuring rod of
the new age sages.

THE NEW AGE SAGES are those
who make yet unheard musics.

YET UNHEARD MUSICS,
unseen images — the mute
speech of the new age.

THE NEW AGE mysteries and
magic unraveled through art.

THROUGH ART man will learn
to know and feel the rhythm and
tempo of his time.

THE RHYTHM AND TEMPO OF HIS
TIME are at once fast and slow.

AT ONCE FAST AND SLOW:
paradox in nature's mode
of operating.

OPERATING at high speed —
light — to produce slow changes.

continued...

part 3

TOWARDS A NEW MIND BODY MUSIC

DAVID MOTT

In Part 1 (Musicworks No. 19) of this series of articles, I wrote about the importance of what I called Will. Defining Will is a little like describing a taste; at best, one can hope to arouse the imagination. However, if you have had the experience of practising any of the meditations which I presented in Part 2 (Musicworks No. 20), then you have been introduced to this greater resource called Will.

Will is the great depth of selfless desire that lies (if we can place it somewhere!) beneath the surface of our discursive mind. If you are able to quiet the discursive mind, Will flows in to fill the gap, producing the state of clarity, grace and strength that is our natural heritage. It is a positive energy of unlimited capacity once we have unblocked its flow; but this unblocking requires both perseverance and vigilance. The habits of our discursive minds have been formed over the years of our lives and these habits (or thinking patterns) are stubbornly resilient. Any desire for change seems to be resisted by the discursive mind. Perhaps you have noticed the way each of us has of cleverly procrastinating or avoiding a whole hearted commitment to the work of quieting the discursive mind. Even when such a commitment has been made, it is still easy to be swayed away from such work by either negative or positive experiences. Nevertheless, the deeply felt desire in each of us to discover this powerful part of our being does manage to work its way to the surface of our awareness. Ultimately what is necessary is to put Will and the discursive mind in harmony but in order to do this, it is necessary to appreciate the limits of the discursive mind, to perceive its habits clearly and to be able to use Will (or rather to be used by it).

Acting out of Will is a matter which the Taoists call "according with the Tao". In this "according with the Tao", all duality is erased, inside and outside become unified, subject and object become one.

"Minds free, thoughts gone
Brows clear, faces serene.
Were they cool? Only cool as autumn.
Were they hot? No hotter than spring.
All that came out of them
Came Quiet, like the four seasons."[1]

We can contrast this with willfulness, the selfish and childish notion that each of us has the right to inflict our petty desires upon the world. Willfulness creates much unhappiness in us as the myriad dualities that arise from seeing ourselves only as separate from (alone or even against) the world, set us against the current of life. "Too much happiness, too much unhappiness, out of due time, men are thrown off balance. What will they do next? Thought runs wild. No control. They start everything, finish nothing. Here competition begins, here the idea of excellence is born, and robbers appear in the world."[2] Will on the other hand creates in us a powerful peacefulness that is neither dependent upon happiness nor is moved by unhappiness. Will is not a tool at our disposal, rather we are a vehicle for Will in that we have to yield ourselves to it.

"Let him sit like a corpse, with the dragon power alive all around him. In complete silence, his voice will be like thunder. His movements will be invisible, like those of a spirit, but the powers of heaven will go with them."[3]

The meditations in Part 2 are an excellent way to develop our receptivity to Will. However once begun, the practise of these meditations has to continue without stop. As all of us know, there is never a time, as musicians, that we can stop our work of practising or composing or improvising — if we want not only to continue to grow but even to hold our own in our developed craft and creative vision. And so our work with meditation is the same. We can call this effort, making our lives artful.

I hope that as musicians we have all had the experience in music (whether it be creative or interpretive performance) of disappearing into the performance so

"To begin, stand wider than shoulder width with toes angled slightly out to the sides. Sit down into a medium-low horse position.* Be very sure that the inside edge of your knees are outside of the outside edge of your large toe. This position is very important in establishing your structural root, that is, the proper alignment of joints which makes the body unshakeable and immovable.

To accentuate the position, imagine that there is a force pushing out laterally against the insides of the knees. Then think that there is an equal force pushing in against the outsides of the knees. The resultant feeling will be that the knees cannot be pushed either in or out, that they can only bend up and down as they are made to do. There should be a feeling of the knees being braced.

Next, centre your weight directly over the Bubbling Spring. Bubbling Spring is an acupuncture point also known as Kidney One, or Mountain Spring. It is the first point on the kidney meridian and the kidney is the first and foremost organ for chi in the human body. It is the Original or Immortal Heavenly chi which forms the energetic root of the human being. This point is located just behind and a little outside of the ball of the foot.

You should feel as if the line of gravity from the crown of your head falls directly down through the core of the body right down onto this point. That means that you should feel your weight evenly distributed over the entire surface of the foot. You should feel all five toes on the floor like a gecko's or a lizard's. You should also feel your heel and both the inside and outside edges of your feet.

Imagine that beneath the Bubbling Spring there is a well that stretches down to the center of the earth, one under each foot. Think that there is a warm, gushing geyser of "chi-light" bubbling up from each of these walls and that these geysers of chi enter the body and rush up the legs toward the thighs and loins. Imagine that the point of entry at the bottom of the feet is about the size of a nickle.

Now, think that because chi is gushing up through the Bubbling Spring, the weight that is falling from the crown of the head down onto the Kidney One is displaced to the periphery of the foot so that you feel your weight around the outside of each foot like an

* Standing with the body in the same position as sitting on a horse.

that the "music plays us". This losing ourselves is simply an experience of Will. It is wonderful when that happens as the performance is always so strong and clear. The experience (as the performer) is also too marvelous to accurately describe (I could try by saying that it is like being perfectly calm and aware inside of an incredible current of energy), but it is worth taking great creative chances for. Therefore I have presented this article to get you to consider a more holistic way of incorporating Will not only into your music but into your life. i hope that you can take even greater creative risks by engaging yourself in this work.

The flute is played without playing.
The sound is heard without listening.
With no one to play
and no one to listen
how clearly the breath moves the ears.

The Taoist meditation which I am presenting here, is especially good for developing receptivity to Will. It is a standing meditation which pits the largest and strongest muscles in the body against the relentless force of gravity. The difficulty of standing this way for any period of time (eventually up to 45 to 60 minutes) provides ample opportunity for Will to give strength to the body through the vehicle of chi (discussed in Part 2).

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1 **The Way of Chuang Tzu** by Thomas Merton New Directions Book page 61
2 Ibid. page 70
3 Ibid. page 71
4 **Tai Chi Nei Kung** by Bob Flaws Inside Kung Fu Pages 52-54 Vol. 7 No. 4 April 1981 CWF Enterprises Inc.

Recommended Reading:
Tao Te Ching by Lao Tzu Penguin Classics
Seth Speaks by Jane Roberts Bantam Press

VID INGELEVICS

David Mott and Tina Pearson.

overturned cup and saucer. Let the edges of this cup be the walls of the wells which stretch down to the center of the earth. Therefore you will have two continuous and seemingly opposite lines of force running through the legs: one from the body down into the earth and the other from the earth up into the body. This visualization will develop in you a very strong connection with the earth energy, a strong energetic root.

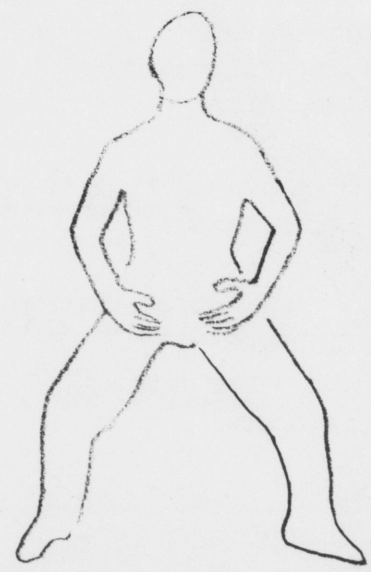
The hands should be held at the level of the Lower Tan-tien or four finger widths below the navel. The arms are rounded as if you were holding a big imaginary barrel. The palms are facing in towards the body and the elbows are held out to the side rather than pointing down. There should be a sense of fullness and roundness in the arms without any sharp angles or protrusions at the joints. There should also be a feeling of space under the armpits. Imagine that there is a hoop of light running thorugh the arms and across the back.

As you stand in this posture you should try to center your mind and your breath, which should be abdominal in the Lower Tan-tien and you should feel a pull or magnetic sort of connection between the fingertips back to the Lower Tan-tien.

Having assumed this posture, hold it as long as possible. At first you may only be able to maintain it for 5 to 10 minutes. Prepare a training schedule and make an agreement with yourself that each day you are going to increase the length of time you hold the posture by a predetermined increment. Your goal should be from 45 minutes to an hour or so.

This posture is practised everyday for 100 days, without missing a day. If you miss a day you should start from the beginning. Each day be sure to hold the posture at least as long as the day before and for as long as you have intended for that day.

In the course of this training, the student learns to use only those specific muscles and parts of muscles that are actually necessary and is forced to relax everything else out of sheer desperation and exhaustion. The student also learns to tap into a source of energy usually not experienced before, and learns that he or she can do far more than they had believed themselves capable. [4]



SLOW CHANGES in plants
caused by explosions on the
surface of the sun.

THE SUN's rays, travelling at
ultimate speed, melting snow.

MELTING SNOW turning,
via waterfalls, into
fast electric light.

ELECTRIC LIGHT made man think
he didn't need sun's energy.

SUN'S ENERGY: the
fountain of all forces of
life on our planet.

LIFE ON OUR PLANET preserved if
man learns to live with nature.

TO LIVE WITH NATURE:
the foundation of the new
viconian age.

THE NEW VICONIAN AGE
has barely begun, is young.

the YOUNG must forsake
their memories and follow
the new age sages.

THE NEW AGE SAGES speaking
out loud: einstein, fuller, cage.

EINSTEIN, FULLER, CAGE:
truth is indivisible,
is life as it is.

LIFE AS IT IS best studied
studying sound as it is.

SOUND AS IT IS has
been cage's prime concern for
half a century.

A CENTURY of changes —
cage has many disciplines.

CAGE'S DISCIPLINES:
brown, wolff, feldman, tudor and
the sonic arts group.

THE SONIC ARTS GROUP: mumma,
ashley, behrman, lucier.

continued...

EXPLORING THE VOICE

JOAN LaBARBARA

When asked to write about my work I am often confronted with the fact that how I describe my work depends on my current focus. With that in mind, I'll give some background before describing my most recent activities.

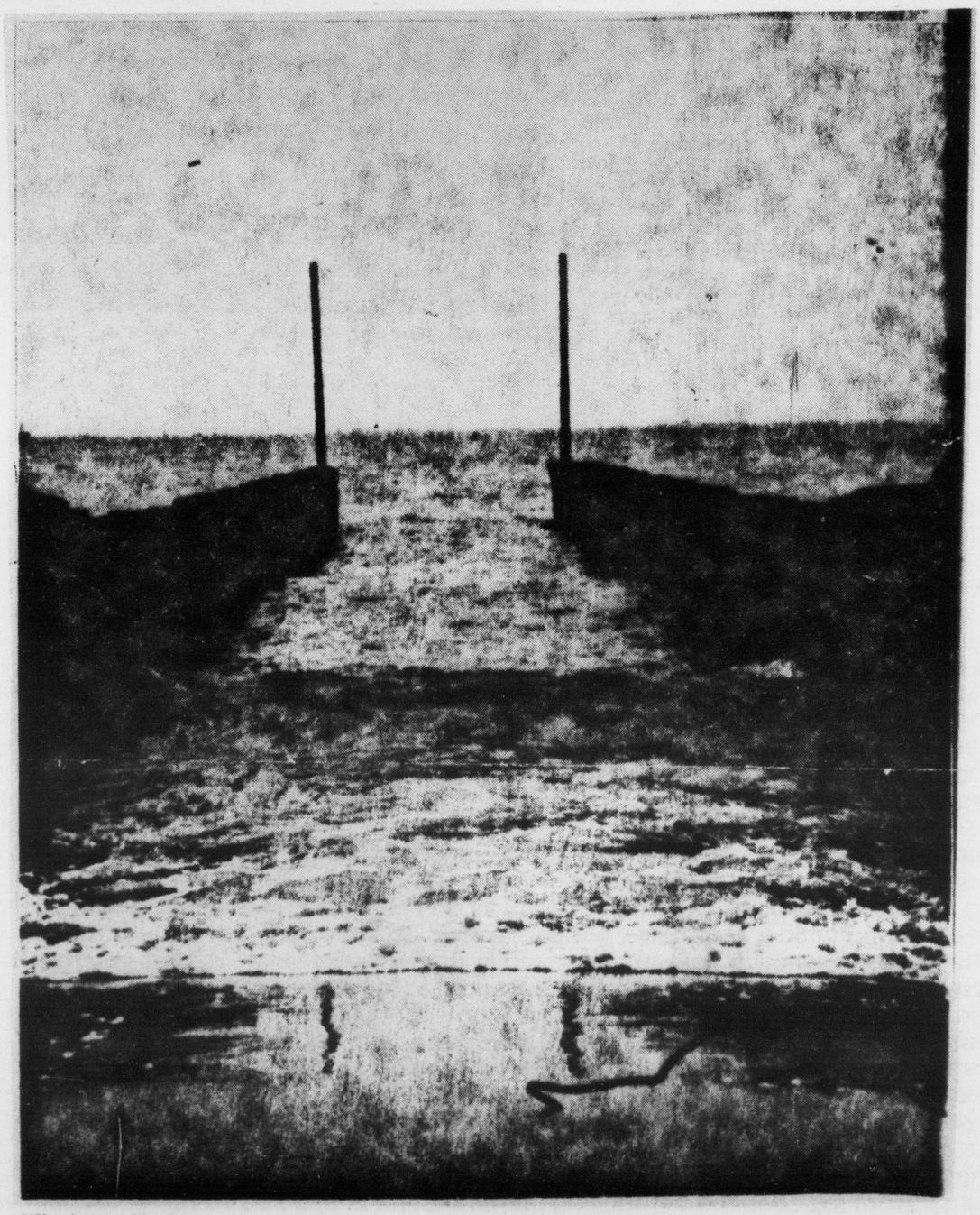
When I left classical music (in 1970) I was searching for a music that felt right to and for me. I didn't want to do what had been done, and so well, for so many years; I wanted to break new ground, discover sounds, explore the voice. So I went to jazz to free the voice from some of the constraints of western classical technique and I began improvising with instrumentalists, imitating their sounds, becoming equal as an instrument. I did some commercial singing which, strangely enough, led me to Steve Reich (in a commercial for Michael Sahl I was called in to replace a Japanese singer who sounded "too Japanese" for the ad agency and found myself, during the course of the session, running the gamut of sounds between imitating a koto to sounding like a Japanese Astrud Gilberto) who wanted to find singers to imitate bongos and marimbas for his work-in-progress, DRUMMING. So, in February 1971 I began work on DRUMMING and worked with Reich through the recordings of that and MUSIC FOR MALLET INSTRUMENTS, VOICES AND ORGAN. I also worked for Philip Glass for 3 years (from 1973-76), initally singing the trumpet part in MUSIC WITH CHANGING PARTS, then doing vocal parts written for voice which integrated into the instrumental context of later works. During these years I also worked for John Cage, Alvin Lucier, David Behrman and Robert Ashley, each of whom utilized a different aspect of vocal expertise and/or musicianship.

Simultaneously, I was developing my own music, doing a lot of improvising with jazz, new music and fusion artists and in 1973 formed a cooperative band with 5 other musicians (Charlie Morrow, Carole Weber, Harvie Swartz, Bruce Ditmas and Rich Cook) presenting a series of concerts at Washington Square Church in New York during the '73-'74 season, integrating our soundwork with that of guest poets and writers. Unfortunately the concept of "cooperative" differed from person to person and the group disbanded after that season. But much of the work done during those concerts and taped rehearsals or work sessions has become part of each of our musics. In fact, I "discovered" multiphonics during a taped worksession, improvising to poet Armand Schwerner's reading the Mila Repa (Tibetan Book of the Dead). It took me nearly 3 months to successfully develop a technique for double and triple stop singing that allowed me to accurately produce these simultaneous multiple sounds but now I can successfully teach the technique to 85% of those who study with me, even in a single workshop session.

My earliest pieces ran the gamut from highly experimental art performance works, like HEAR WHAT I FEEL; to intensely minimal works, including VOICE PIECE: ONE NOTE INTERNAL RESONANCE INVESTIGATION.

HEAR WHAT I FEEL involves sensory deprivation and unrestrained vocal/emotional responses to tactile stimuli. I continued to learn about the piece as I performed it. During the hour spent in isolation with my eyes taped shut I increasingly sensed my own vulnerability as my ears reached for sounds, perhaps signs of impending danger. After a time I found it simply was too distressing a piece psychologically to perform with regularity. Not until PERFORMANCE PIECE (1974, revised 1979) did I again venture into such treacherous psychological territory. The audience reactions to the frist performance of HEAR WHAT I FEEL were intensely emotional; some people told me later that it was so highly personal they felt as if they were experiencing my emotions directly on a one-to-one pre-verbal communication level.

VOICE PIECE is a study of the vast spectrum of sounds that can be created from a single pitch. By moving the sound (thinking of it as a solid object, a ball that I could roll from one internal space to another) into different resonance chambers in the had and neck, I found that remarkably different tone col-



Vlissingen Harbor.

ours resulted, including isolation of specific harmonics and the split into multiphonics. I also remember reading, while trying to justify the copyrighting of my "one-note" piece to the U.S. Copyright office, a wonderful statement Schoenberg had written about timbrel melodies being the future, the unexplored territory, and being very gratified that I had unwittingly taken his fantasy forward.

CIRCULAR SONG is a rather complex work; to some it is sculpture: the body in motion is an intense and integral part of the work; to some it is an etude; to some it is form personified in its circular, palindromic shape; to some it is a vintuosic physical task; to me it is all of the above and a lovely piece as well. The piece came directly from my imitation of instrumental techniques, i.e., the circular breathing technique of horn players, in which they hold air in the cheeks, forcing it out through the horn by means of the cheek muscles as they inhale through the nose to create a constant flow of sound. Of course, this particular method is impossible for singers since the sound-producing mechanism lies below the cheeks, so I had to develop my own method and decided that inhaled singing was the only way to create as close to a constant flow of sound as possible (i.e., inhaled and exhaled vocalization on the same or different pitches). The glissandi and mirror image came to me just a few days before the first performance. I often, to challenge myself, schedule performances of works not yet completed to place myself in a stressful situation, needing either to realize the piece in performance or just prior to it. In fact, when I first performed CIRCULAR SONG I did not know if I could complete the work without hyperventilating, an exhilarating circumstance under which to perform.

My early instrumentalal works focused on different aspects of controlled improvisation. THUNDER for six tympani and solo voice with electronics (1975), gave melodic content to the percussionists and punctuation to the voice, reversing their usual roles. A specific melody was written out and then verbal instructions were given to the players to work with this melody along the rhythmic and emotional lines of their favourite thunderstorm.

The IDES OF MARCH series, which will eventually include 15 separate works, began with a work for string quartet (violin, viola, cello, double bass), 3 voices, (soprano, alto, baritone) and percussion, dealing with the acoustic phenomenon of "beats" (bumps or flutters) occurring between closely tuned (but not absolute unison) pitches. The entire series uses the voice as an equal instrument with other pitch-producing instruments, creating the "beating" material against which the percussionist improvises. In certain cases, strict scores were worked out when uncooperative musicians preferred to simply read pitches rather than to think about the task at hand but for me, part of the piece was finding out how each musician, confronted with this particular task, would react in performance.

My works on multi-track tape, which began with the commissioned work TWELVESONG, recorded for and at Radio Bremen in Germany, use the voice to create almost an orchestra of colours and textures. TWELVESONG for five live voices, and KLEE ALEE (1979) commissioned by RIAS in Berlin, are all what I consider "sound paintings". Most of the material occurs with the first few moments but as the piece progresses, different aspects are brought to the foreground focussing one's attention on that particular detail within the overall context, much in the way one takes in a painting as a whole at first and then, as one gazes longer, one notices particular details of form, colour and content.

My other tapeworks are quadraphonic "soundances" in which I treat the sounds as 3-dimensional objects moving in space. In some cases I have used the Buchla synthesizer to modify the sounds but more often I have used it to locate and move the sounds according to a specific plan. CYCLONE, an International Jury selection of the ISCM League of Composers in May 1977, was designed to create a cyclone out of sound, travelling via at least 8 speakers towards the audience and evetually surrounding them with whirling cacophony.

Recently I have concentrated in two directions: works for voice with pre-recorded tape and works for voice with instrumental ensembles. Of the latter, CHANDRA, commissioned by Radio Bremen for the Pro Musica Nova festival in 1978, scored for solo voice with electronics, male chorus and chamber orchestra, is a kind of ritual in which the high priestess sings a multiphonic chant, doubled by tympani and tuned drums, followed by the male chorus in multiphonic unison and then orchestrated. Currently I am working on VLISSINGEN HARBOUR for voice and 7 instruments, inspired by the isolation and natural sculpture found on the beahces of Vlissingen in southern Holland and THE SOLAR WIND for voice and 10 instruments, focussing on solar flares interrupting and intensifying the steady flow of particles from the sun to the earth, known as the solar wind (both will be premiered in Los Angeles during the 1982-83 season). My eventual goal in this direction is to integrate the voices within the orchestral texture both physically and aurally.

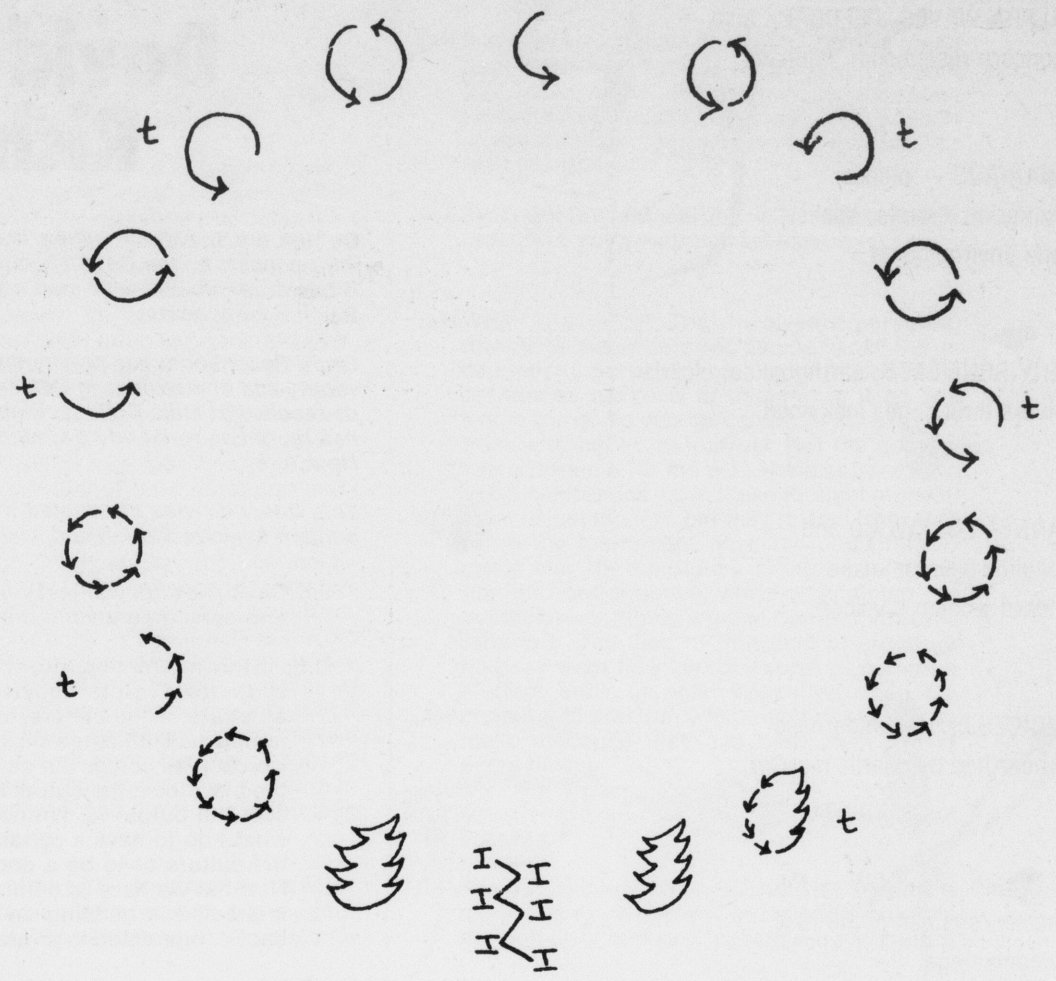
Of the new voice with tape works, OCTOBER MUSIC: STAR SHOWERS AND EXTRATERRESTRIALS (1980) places the audience beneath a night sky created by quadrophonically generated vocal sounds placed in space while the live voice part is a tour-de-force of inhaled/exhaled singing derived from material on the tape and additional related sounds; WINDS OF THE CANYON (1982) is again a ritual, this time directly inspired by a Corn Dance I experienced at the Santo Domingo pueblo in New Mexico during August 1982. In making this work I tried not to imitate the sounds of the Indians but to create a work in homage of this brave and determined people. The sounds on the tape include multiple layers of multiphonic chanting (done by myself, to sound like a male chorus) and inhaled pulsated fluttering above, while the live vocal part, punctuated by hand drum, evokes the spirit of the "clowns", the individuals who are free to dance alone and to sing their own song.

I have also explored very personal territory as in the work PERFORMANCE PIECE which deals with the right brain-left brain theory of separation of creative and logical, making "musical" sound and breaking off to comment on the sound or the expertise of performing, evoking a sense of the artistic process in real time, in performance.

This, of course, only gives a cursory overview of the work that has occupied me for the past 12 years, exploring the vast and, until recently, relatively undeveloped field of the voice. Whether we call it experimental or "extended" vocal techniques, I have discovered that many of what we consider to be "new" sounds have existed for centures in the music of other cultures. So we are rediscovering traditions that fell out of fashion. Perhaps I entered this area as a kind of scientist, trying to break new ground, allowing the voice to teach me what wonders it could produce if I merely allowed it the freedom to give me its sound. But after a time my work clearly moved into the area of composition, dealing with the sounds as other composers deal with instruments, and now integrating the voice back into an instrumental context. It is not that the experimentation is over; it is merely that I am working with the fruits of my labors until I need to break newer ground.

 23 November 1982

CIRCULAR SONG



Instructions:

- beginning at top center with first exhaled descending glissando from comfortable top to bottom of range, change breath at bottom of range and ascend on inhale to top.
- repeat figure until too exhausting or no longer musically interesting.
- use transition figure ↶t to move to next repeating pattern in which breath changes occur at midpoints of vocal range. repeat as before.
- use next transition figure ↶t to move to repeating figure with 3 breath changes per range sweep, alternating inhale/exhale.
- after 3, move on to 4 changes per range sweep.
- then move to one step/half back figure in which one inhales upward then exhales halfway back down, changing at top to exhaling down and inhaling halfway back up.
- One has now arrived at the central figure, the midpoint: alternating inhaled and exhaled multiphonics, one moves from the lower to upper part of the range and then swoops down into the step/half back figure and proceeds through each repeating figure, in reverse, until arriving again at the beginning.

BEHRMAN, LUCIER
probing rooms' resonances,
alpha-waves, feedback.

ALPHA-WAVES, FEEDBACK also
concern rosenboom, neuhaus.

NEUHAUS — pioneer
exploring circuits, spaces
and environments.

ENVIRONMENTS, earthquakes, clouds,
rivers thrill annea lockwood.

ANNEA LOCKWOOD and
pauline oliveros make
heard women's voices.

VOICES of new wilderness
unearthed by charlie morrow.

CHARLIE MORROW — the
healer/shaman of the new
viconian age.

THE NEW VICONIAN AGE
is here — for us to live in.

TO LIVE IN this age
is to nurture new ethics,
morals, attitudes.

ATTITUDES of no power,
dominance or violence.

NO VIOLENCE of
man to man, man to nature,
nation to nation.

NO NATION states to keep us
from being one human race.

ONE HUMAN RACE not
accepting separation
by colour or creed.

ONE CREED for all mankind: to
live in peace and love and truth.

PEACE BY LOVE AND TRUTH —
we find it in nature as
a matter of sound.

UDO KASEMETS
October 31 — November 2, 1982

IN CONVERSATION:

David Rosenboom and Richard Teitelbaum

On Nov. 6th, the Music Gallery in Toronto sponsored a joint concert by the Gallery's musician in residence, Richard Teitelbaum and also special visiting guest David Rosenboom.

David Rosenboom has previously taught at York University and now resides in Oakland, California, where he teaches at Mills College. Richard Teitelbaum also has taught at York and now resides near Woodstock, New York.

This interview was conducted the day following the concert by John Siddall and Andrew Timar.

J.S. David, how do you feel you and your music fit into contemporary culture?

D.R. I'm into interacting with all of the culture in the sense that I'm into studying what's going on in all strata of the culture, learning from it, and letting it all influence me. It's all input, in other words. It all comes out as output, that is if I'm the black box, the output is going to be whatever the output is. I'm not really structuring what I do to have a certain size of impact on the culture or to be a populist, for instance. Not that we have to define that word. I'm not interested in molding myself to be populist, but I'm interested in interacting with culture.

J.S. What I mean, in fact, by populist is that one would be concerned with how both the input and output would involve all strata of culture.

R.T. David, why do you want to interact with the culture? Do you mean just communication?

D.R. No, it's not communication, not at all.

R.T. The input was the part I was wondering about. I'm on a trip where I want to control the input as much as possible, because I don't think it's particularly valuable; a lot of mass communications, watching too much television, you know. It's all right to do it for a couple of weeks, but if you were totally addicted to it...

J.S. Why do you deal with all the culture?

D.R. It's just interesting to me. It's a musical anthropology. I'm interested in what they're doing and why they're doing it. It's not that I'm necessarily interested in the content. I listen to the radio often to find out what's going on, but not necessarily to listen to the songs.

J.S. You're talking about input. What is David Rosenboom's output into the culture as a whole?

D.R. I'm interested in experimenting with the forms of framing messages that exist across this culture and will sometimes experiment with using some of them, but I like doing it in a way that has implications for as many strata as I can think of. That's not something that's a fixed attitude either. It's something that varies with activity and time. You go into phases where you want to really narrow down. I go through phases of that too. You know those *In the Beginning* pieces, those are the most abstract, the most narrowly aimed item you can imagine as far as the audience is concerned. They're kind of hard to listen to in some senses because they're very intense and long, but they're full of complex relationships. I got absorbed by those relationships and what they were producing and so I allowed myself to produce a series of pieces that are definitely not involved with producing immediate gratification for all cultural strata. It's hard work to listen to those pieces, but it's worth it in a lot of cases.

R.T. It's harder work but it makes it worth more ultimately than the ones that are not.

D.R. I do differentiate in the richness of content of imagery. There is imagery which is just simply richer, it just has more in it than others. Regardless of all of the things we've learned and if you come back somehow richer for that experience then it's much more meaningful.

R.T. Are you speaking as a composer or listener?

A.T. Both. It just means more if you learn that way. I guess that's the only way you can learn.

D.R. In some cases it's just what the natural structure of the image is. Some imagery requires repetitive involvement, and it's rich because each stage of involvement leads to a new insight which leads to the next stage of involvement which leads to a new insight, etc. And something that's rich enough to continue engaging you for many repeated contacts is a rich thing. When I listen to Olivia Newton-John I like those songs, but I like them just a few times, then I have to have a new one. Repeated coming back to it doesn't produce more growth.

J.S. What about the tunes like the Beatles tune we hard at the cafe. That song affected Richard.

D.R. Yes, but there's a differentiation in that cultural milieu as well. We're sitting here assuming that Olivia Newton-John and the Beatles are in the same cultural mileu, that they're on the same strata. In a certain sense of the electronic communication nervous system of the earth, they are. They use the same channels of distribution, but they're not the same.

J.S. It's all a matter of context.

D.R. That context is an extremely important part of our perception of it. There are some of those songs that are just terrific, they are rich...

J.S. Those are the songs that I'm interested in. That for me, gets at one aspect of a populist music. That's why I say, the effort that it took to do those songs is as meaningful as the effort it took Beethoven to do something else.

A.T. There's another kind of thing that comes from cultural change, from time distancing. Eenie Weenie Yellow Polka Dot Bikini, might be interesting for a different reason than some other pop tune.

R.T. What's wrong with Itsy Bitsy Yellow Polka Dot Bikini?

A.T. I'm sayng it's rich, but in a different way. It's rich because...

D.R. ...it's part of something bigger.

A.T. Yes, like style and fashion. Fashion is rich because it changes.

D.R. Yes, and it's part of memory.

A.T. Time does things to it and memory does things to it. Maybe memory isn't static, maybe that's it, nothing is static.

D.R. I don't think it is, I think it's transformational. I think that's a basic difference between brains and computers. Memory is transformational in brains and it's static in computers. Consequently, that's one of the things that makes the brain capable of making general decisions so quickly. It can make general assessments of a stimulus and generate alot of reaction if that assessment requires a lot of evaluation faster than computers, so that it's highly parallel process. In computers their superiority is, of course, in doing very precise small things very fast, but not handling parallel streams of data reduction and assessment.
Memory being transformational is a requirement for there to be an ontology of the individual. There isn't any ontology of the computer. It doesn't have an individual evolution. As Dreyfus points out, the guy who is the big critic of artificial intelligence, that one of the most important things lacking in a computer that makes it different from humans is that it doesn't have a body. Not that it doesn't have a brain, its brain is all right, but that it doesn't have a body that evolves and interacts with it, which it can inhabit and develop a self-image of.

A.T. I remember a story by Sartre which deals with that, it's called *Le Jeux sont fait*. It's about these people dying and coming back as spirits during the war. They loved each other in real life, but their love cannot ever be consumated as spirits. It's the same kind of thing, there's that tension. It's that limitation of the body that makes us interesting.

You and Richard, ever since I've known you two, have been concerned about not only music but also in machines aiding in the act of music making.

D.R. Part of it comes from the fact that its hard to be a composer and not get involved with instruments in some way, like making instruments. There are composers who do, of course, just write, but even they on some level are dealing with creating new timbres and for them orchestration is the instrument that gets built for them. From that extreme to the extreme of Partch or extensive electronic instruments that are personal, it's a real tendency for a composer to want to get involved in making instruments. That's part of it and the other part is just the broad conceptual space that exists in electronics. Since it has a certain abstraction it also lends itselfto one's imaging great communications structures as instruments. It lends itself to thinking about extending the idea of what an instrument can be. So that is one of the reasons that attracted me to using electronics and electronic machines.

As far as computers and specifics are concerned the original attraction to computers was the idea that you could make resident in an instrument that was theoretically playable in real time, you could make resident, models of compositional thought. The whole area of algorithmic composition being a sort of artificial intelligence which tries to make models of compositional thinking. It seemed to me one could easily realize the limitations of that view. It is the same view of the limitations of artificial intelligence, that is that it's the old debate about is it possible to make a network of millions of switches emulate human process. The question is sort of irrelevant because the main thing is that in striving to do so new tools have been produced that you can do other things with.

A.T. Is it irrelevant to ask whether that's quantitatively or qualitatively different from playing the violin?

D.R. It is qualitatively different for me, not so much quantitatively. That's a personal judgement, but I can make many more simultaneous voices electronically than I can with a violin alone, although, I can also make a lot of voices with the violin.

A.T. Every instrument carries with it those attitudes and compositional techniques.

D.R. What is a voice? That involves a perpetual threshold level where you decide to call the independent parts of something independent entities as opposed to thinking of it as one whole thing. So you can create a sonic spectrum with either instrument. But the qualitative difference for me with the electronics is; in the electronics, I can these thought models. They're just models, but they're also tools that make the instrument have the capability to really blur the borderline between composition and performance, while maintaining the possibility of highly worked out and intricate structure. The idea of that kind of structure and say even free improvisation as being on distinct ends of polar opposites, then becomes a distinction which isn't necessary to make, because they can both exist at the same time.

A.T. Does it have anything to do with hardware and software?

D.R. The hardware makes it possible by becoming more and more general in its capability and the software makes it possible by making it more and more powerful so that it can do things that you need in real time.

A.T. Composition and improvisation. So the ultimate computer would be just software.

D.R. It would have to have hardware too to make sound, to vibrate air molecules.

A.T. You know the Indian idea that the ultimate in sound is somehow beyond molecules vibrating. It's a very personal experience. You can't communicate that.

D.R. It's something that by definition can't be communicated.

J.S. Richard you've been doing some work recently with acoustic pianos and computers.

R.T. My current obsession is the Pianocorder work.

A.T. How did that begin?

R.T. I'd heard about these machines several years ago and have been thinking about it and trying to get my hands on them. Nancarrow is the musical inspiration.

A.T. This instrument, the Pianocorder along with the computer equipment, is an improvement on the old player piano?

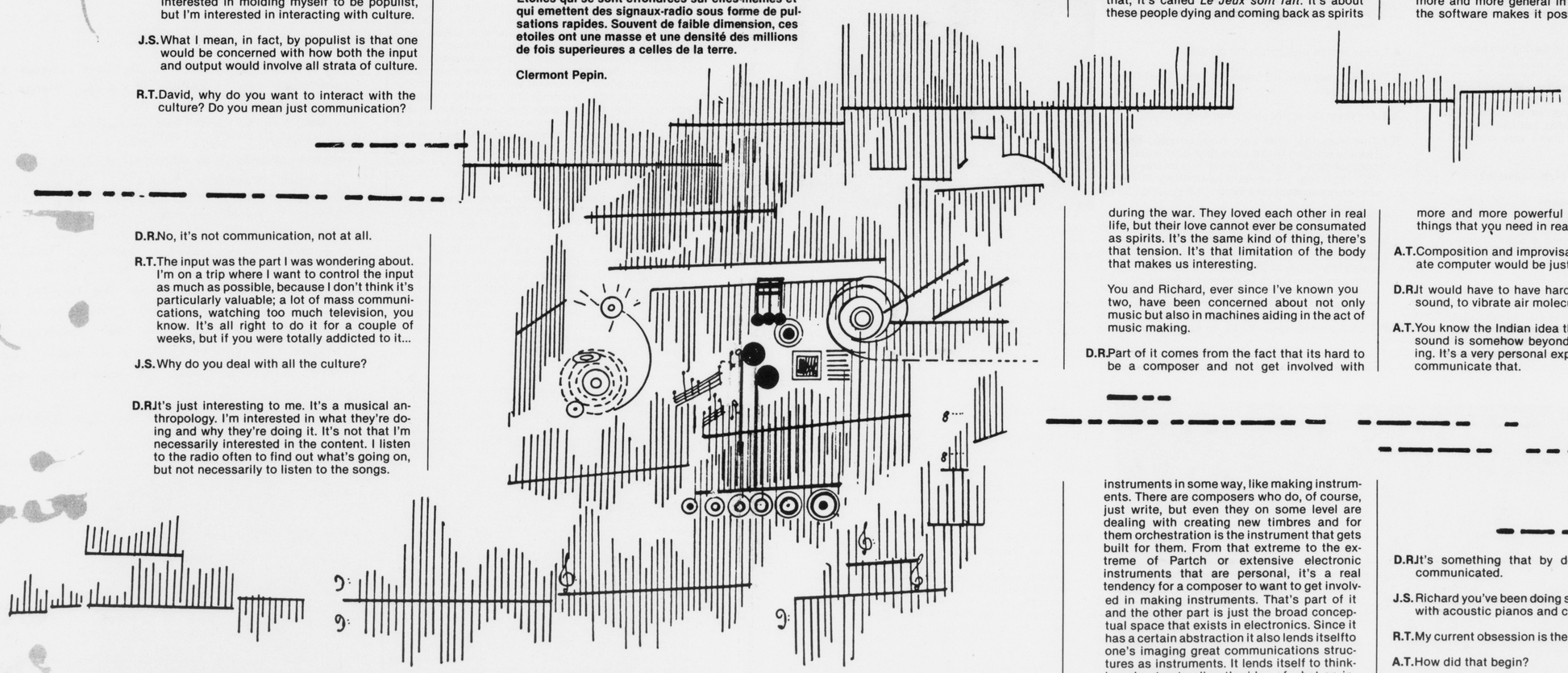
R.T. In some ways it's better, in some ways it's not, but the real improvement is that it's digital and it's electronic so you can control it with a computer rather easily.

J.S. There's a computer which understand the input from the piano you're playing and sends that information to any number of other pianos to be played.

PULSARS

(de Nuclées) pour percussions.
Etoiles qui se sont effondrées sur elles-memes et qui emettent des signaux-radio sous forme de pulsations rapides. Souvent de faible dimension, ces etoiles ont une masse et une densité des millions de fois superieures a celles de la terre.

Clermont Pepin.



R.T. Yes, and you can program it so it will do whatever you want to.

J.S. In other words, respond to that input from the first piano in different ways.

R.T. Yes, such as doubling, delaying or transposing it.

J.S. Let me be the devil's advocate here and ask why you would want to use the computer to create a second piano player when perhaps another human could in fact simply play the other part.

R.T. Two humans can't do the same thing that one human can do, just as one human can't do the same thing two can. John Cage prepared the piano in order to be able to play like gamelan music on the piano. One piano player. That's different than gamelan music.

The thing that interests me is the sonorities that you can get from several pianos together and these pattern things you can do if you delay it and things like that. It should be nice for pattern music, among other kinds of music. It would be nice for Conlon Nancarrow too.

In any case, I don't think two people could have played my piece last night, because the piece was entirely improvised.

A.T. Also Peter Anson, who developed the computer programs mentioned that in the second piece, where you're improvising, that the computer was filling in certain things. That is something which two pianos couldn't do.

R.T. No second pianist could have played all those notes, because after a while you would need at least eight hands. It's accumulating, so that everything I play stays in, except I can wipe it out a little bit if I play over it a certain way. There are all kinds of things you could do that two pianos couldn't do.

J.S. Is it a difficult step to go to having ten pianos hooked up?

R.T. It's just a matter of time and money. I'm going to use three in California and I hope to do it in New York. It's a little problematic. It's hard enough to get pianos moved, but pianocorder equipped pianos, there aren't very many of them.

A.T. What is the brand name of this system?

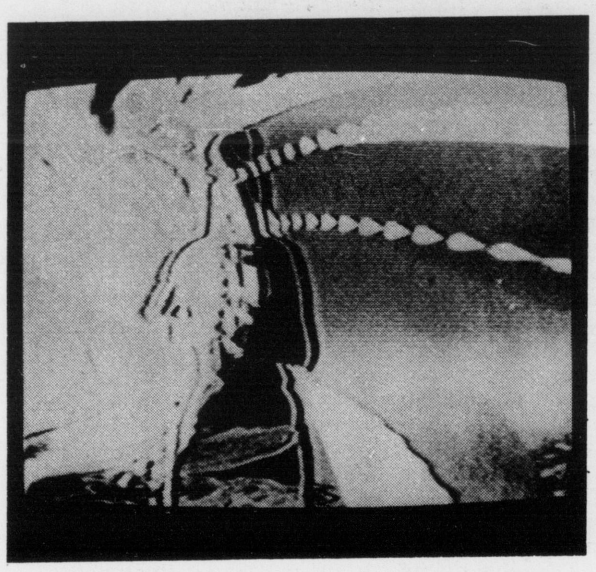
R.T. Marantz Superscope makes it. It's called Pianocorder.

A.T. So presumably, if you had a sophisticated enough system of program you could do Les Noces.

R.T. Oh sure.

J.S. It would be wonderful to see an orchestra of pianos all responding to one conducter piano. Visually it would be a wonderful thing to see. The level of sound generated by one person from acoustic instruments would be wonderful too.

R.T. It is a nice feeling to play the instrument, you get to feel a little bit like Superman. In New York I had three pianos. So you sit here at this one keyboard and have them all around you.



A.T. You had the same system going in New York?

R.T. It was different. We didn't use the computer, it was a digital delay. It ended up not being that different from what we had last night. It was like the first program. I had the three pianos and I also had endless cassettes in the tape recorders so that constantly it was recording and then if I wanted to keep an ostinato going I could flip it into play and then it would take a ten or twenty second or three minute or six minute section on one piano while I played the other two.

A.T. How new is this particular device?

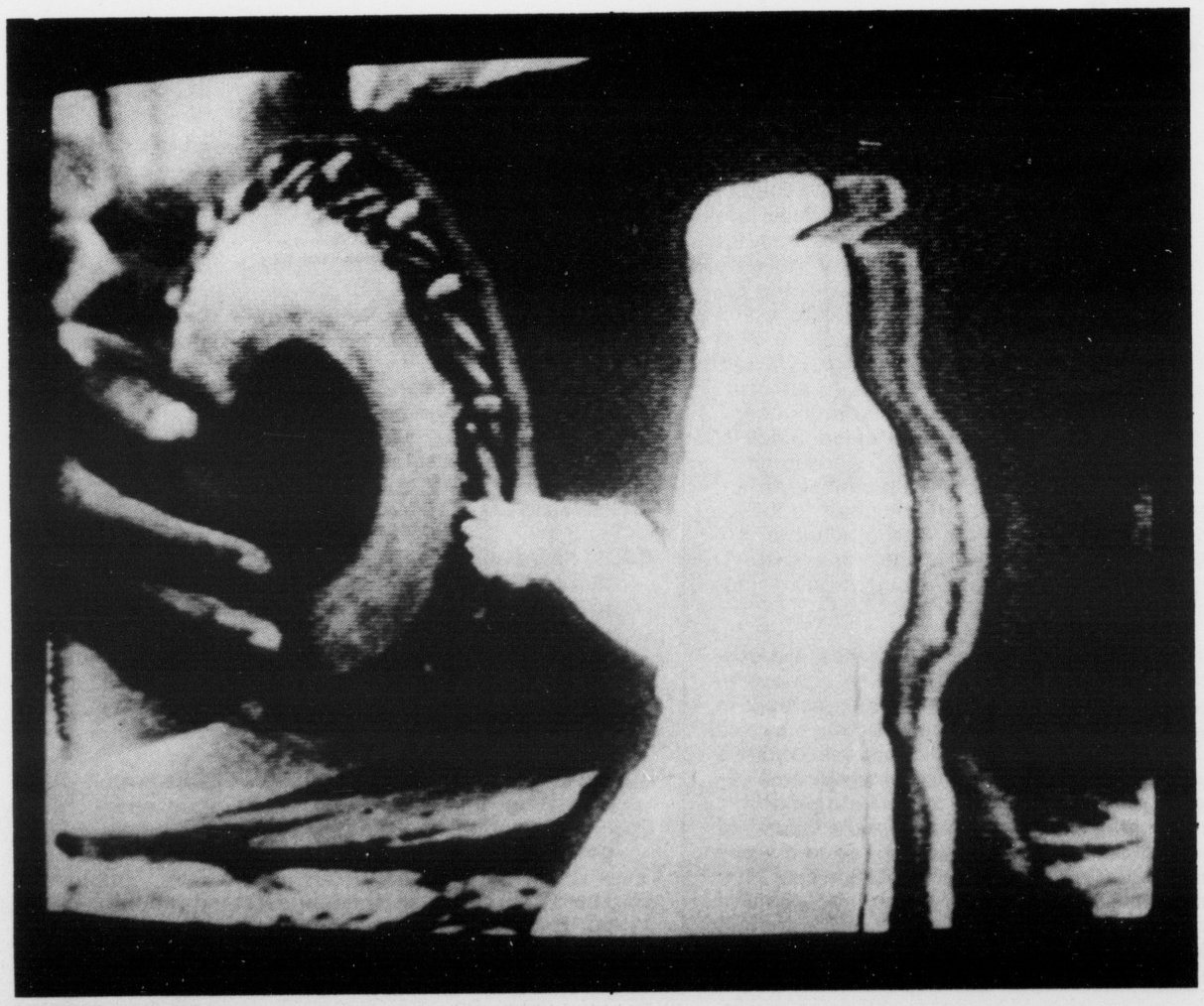
R.T. It's not that new. It's been around at least five or six years.

A.T. Are there other people composing with it?

R.T. This man that was here from Ottawa, Eric Hope is working with it more than from a piano point of view so far, but I think he's interested in composing. He seemed interesting. There probably are other people.

J.S. David, I'm interested to know what stock you can take of the current state electronic music and its technology, and where you might expect it to go in the future. Can we speculate about the future of electronic music? Not too long ago Steve Reich said it was a dead issue. I think we've proven that to be an incorrect assessment.

D.R. It's not a dead issue, that's for sure.

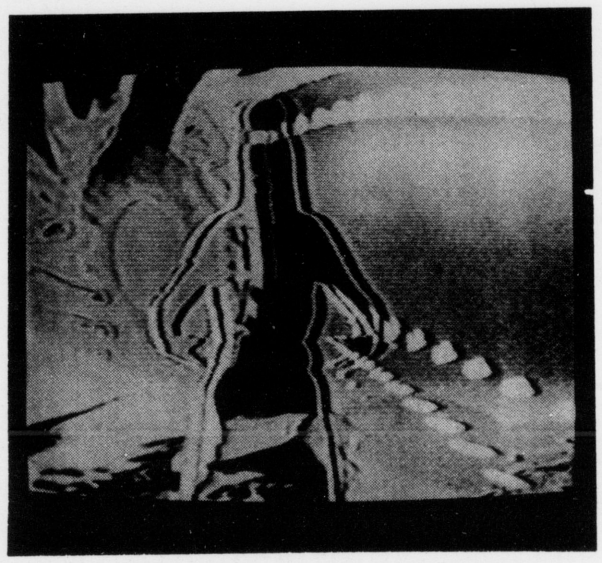


R.T. He doesn't like electronic sound, I guess, which there is a point to. It's hard to make electronic sound that can compete with a good gamelan or good violin. But I think he's a little narrow. But I wouldn't want to stop trying.

D.R. There are two things that you have to look at independently. One is the *things* that are getting created, be they giant computer systems or portable stage instruments, and the research in music that's going on that's connected to it. It's gotten to be such an enormous field that there are alot of mainstreams of development and they aren't necessarily compatible in some ways, but coexist.

The instruments that exist now are getting to the point where the hardware can be generalizable enough and powerful enough that the issue really focuses on software. When I say hardware I mean primarily the sound generating hardware. That means languages have to get more sophisticated. The other weak area is in input structures. That's the thing I miss the most when I play only electronic instruments is that I can't bang on them or use a range of physical gesture in a way that I can on a piano. I can't smash the keys of the Touche like I can smash the keys of the piano.

A.T. There's really a range of gesture in your playing which I realized when I saw it had nothing to do with the sound that was coming out but had something to do with something else.



D.R. It's kind of nice to isolate that and look at it independently because the instrument doesn't respond to it.

J.S. Some machines in fact make sure of that "to correct" deficiences of the performer. Isn't that an aspect of the Synclavier, that you an play something into it and it will rationalize or normalize the input?

D.R. You're thinking of the sequencer you can play into and then can ask to rationalize all the rhythmic executions to be notateable note valves.

J.S. In that case you're using the machine's limitations to its advantage. There's also a drum machine like that, the Linn drum machine. In fact, it's controllable. You can change the resolution, so it will pick up, in fact, greater or lesser degrees of inaccuracies on your part, or however you wish to look at it.

D.R. That's a part of the problem that doesn't interest me. The part that does is the fact that pressure sensitive keyboards, and even inertailly loaded, velocity sensitive keyboards and joysticks and touchpads and knobs are not good enough. There should be a better form of inputting gesture. That's partly due to the software also, because even if we did have, for instance, an inertial keyboard, that has velocity sensitivity that is mechanically meaningful, once we get all that data, what are we going to do with it? How are we going to map the subtle variations onto the sound field? Can you think of one that's as rich as takes place in the action of the piano? Well, you really have to work hard to come up with one that is that rich. It can be done, of course, and it will be done. Both of these areas will get a great deal of attention and development in the coming years. That's what really needs to be focused on now. Once there's a library of approaches to, and the results of approaches of how to make these mappings, then the instruments will become better, more responsive. In other words, the transducing of physical expression, gestural expression, into meaningful information that the instrument can handle will be possible.

Transcribed and edited by Jon Siddall.

UNDERSTANDING INTONATION

JON SIDDALL

"Understanding Intonation" provides the materials necessary for a complete beginner to introduce themself to aspects of intonation. It starts with the most basic concepts and develops these to a level of sophistication useful for proceeding to construct a tuning system of one's own design. Also, I have found in writing the article that my own understanding of intonation has been strengthened through methodical attention to the basics of the subject.

I would like to thank James Tenney for his invaluable assistance in preparing this article.

Elementary geometry is wonderful. Consider, for example, a line like the one shown in Figure 1. This line could represent a string, say one metre in length. There is a compelling interest in finding the mid-point of the line, ie., dividing it into equal parts. The relationship of the whole string to each of these two

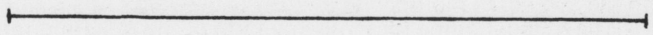


FIGURE 1

halves may be described as one part to two parts, or a simple numerical ratio of 1:2. Ratios are a basic tool of intonation, and a useful instrument for hearing ratios is the monochord. This ancient one-stringed instrument was used by the Greeks in their earliest experimentation with tuning.

Once that first division into two has been made, if the string is then divided into three equal parts there will be string length relationships of one to three and two to three. These relationships are shown in Figure 2.

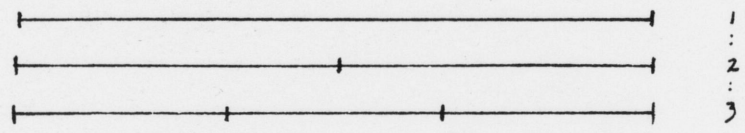


FIGURE 2

This process of dividing the string into increasingly smaller parts could be continued indefinitely producing a large number of string part relationships, or ratios.

Sound, like geometry is also a wonderful thing and if the string were made to oscillate quickly enough it would produce a pitch dependent on the frequency of the oscillation. Then by dividing the string into two equal sections, we would find that each half would vibrate at twice the frequency of the whole string length. For example, if a vibrating string is touched at its mid-point it will produce a tone an octave higher than the open or whole string, ie., two times the frequency of the open string. If the vibrating string is touched at a point one third of its length, the resulting frequency will be three times the frequency of the whole or open string. From this we see that *string relationships are reciprocal to frequency relationships*: if the string were vibrating at 100 cps, and was divided into two parts, the string relationship would be one whole part to two half parts or 1:2, while the frequency ratio would be 200 cps to 100 cps or 2:1.

The note produced by the 2:1 ratio is heard by our ears as having a special relationship to the original note produced by the whole string; in conventional terms, an octave. Because our ears hear this note as a kind of repetition or return to the generating note it serves as a possible *limiting factor* in the construction of scales.

We now have two pitches, the generating pitch of 100 cps and the 2:1 pitch of 200 cps. Again we return to geometry and decide this time to divide the string into three equal lengths as shown in Figure 3. The string length relationship of any one section of the string is one third of the whole or a ratio of

FIGURE 3

1/3. As the frequency relationship of any section compared to the whole will be reciprocal to the string length relationship, then we know that it will be oscillating at a frequency of 100 cps x 3, or 300 cps. Now there are three pitches, the generating pitch of 100 cps, the 2/1 pitch of 200 cps and the 3/1 pitch of 300 cps. If we choose to observe the 2/1 ratio as a limit for constructing a scale with the pitches generated then we multiply the 3/1 ratio by 1/2, giving 3/2, in order to bring it within the *octave limit*. The result is a frequency of 150 cps. The 3/2 ratio produces a pitch that most musicians call a perfect fifth, but the 3/2 "perfect fifth" is not the same as the perfect fifth of the modern piano as we will soon see.

Ratio	Relation to whole	Relation in octave limit
1/1	whole string	1/1 unison
2/1	octave	2/1 octave
3/1	octave and fifth	3/2 perfect fifth
4/1	octave + octave	1/1 unison (or octave)
5/1	octave + octave + major third	5/4 major third
6/1	octave + octave + fifth	3/2 perfect fifth
7/1	octave + octave + minor seventh	7/4 minor seventh

FIGURE 4

By continuing to divide the string into geometrically increasing sections we produce ratios or intervals as shown in Figure 4. Note that because the 5/1 ratio is two octaves and a third above the unison it must be multiplied by

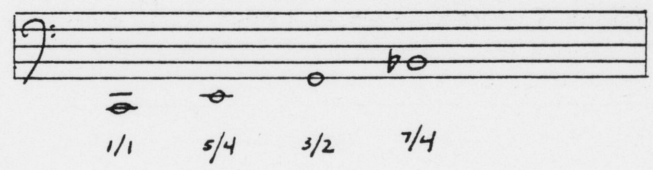


FIGURE 5

1/2 twice. Figure 5 shows, in conventional music notation, the pitches generated by dividing the string into equal parts of two, three, four, five, six, and seven reduced within the octave limit. These pitches correspond to the right hand side of the table in Figure 4, except that they have been arranged in a scale of increasing size from the first note. There are four notes rather than seven because the 3/1 and 6/1 produce the same pitch when reduced within the octave just as the 2/1 and 4/1 both give the same pitch when placed within an octave.

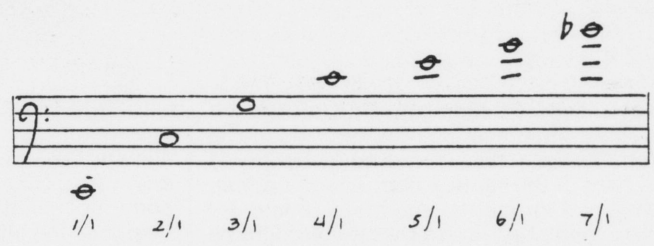


FIGURE 6

Figure 6 shows the pitches generated on the left hand side of the table in Figure 4, that is without being reduced within the octave. The pitches in Figure 6 are the same as those that would be generated as part of the overtone series of the fundamental C or 1/1. In fact, one finds that by continuing to divide the string into successively smaller equal parts the entire overtone spectrum can be generated.

Figure 7 shows the pitches produced by dividing a string into equal parts from two to seventeen. The A ratios are the part to whole relationships while the B ratios are the same expressed within an octave limit. The C ratios are the relationships between successive pitches. By taking into account these relationships a significant number of new ratios are generated, like for example, the ratio 4/3, from row C, an interval we recognize as a perfect fourth, which is not generated as a pitch in relation to the unison no matter how fine a division of the string into equal parts occurs.

In Figure 8, an attempt is made to correlate the traditional interval names used to describe pitch relationships with the ratios of rows B and C from Figure 7. The minor third appears as an interval between successive pitches six and five. However, the 7/6 ratio is also described as a minor third. These two ratios are in fact two different minor thirds. On an equally tempered piano, we know that a minor third is a minor third, ie., the distance of two

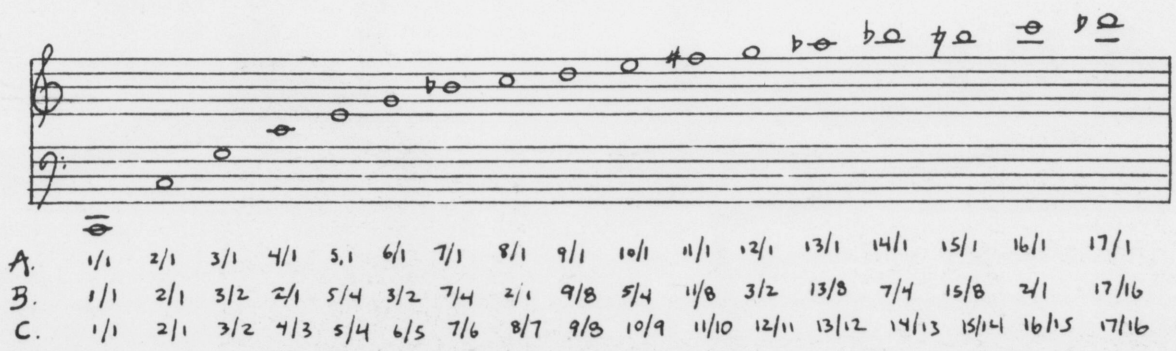


FIGURE 7

notes that are three equally sized semitones apart. Figure 8 shows that there can be more than one sized minor third since a ratio of 6/5 and 7/6 are clearly not equal in size, and in fact will sound different.

The key to solving this problem lies in the words, "three equally sized semitones apart". The Equal tempered system of tuning was designed principally

B.	1/1	2/1	3/2	2/1	5/4	3/2	7/4	2/1	9/8	5/4 →
B'.	P1	P8	P5	P8	+3	P5	-7	P8	+2	+3 →
C.	1/1	2/1	3/2	4/3	5/4	6/5	7/6	8/7	9/8	10/9 →
C.'	P1	P8	P5	P4	+3	-3	-3	+2	+2	+2 →

FIGURE 8

to facilitate a need for equal sized *intervals* so that greater harmonic modulation was possible without venturing into aesthetically unacceptable interval combinations. The specific solution to the problem was to divide the octave into a scale of twelve equal parts. The mathematical result of this approach was an array of twelve irrational number ratios. The sonic result was a series of intervals that are all close to their simple numbered ratio cousins, but adjusted or tempered to a noticeable degree, with the exception of the octave which is a true 2/1. For generations now, musicians have been trained in Equal temperment and as a result think of there being only one sized perfect fifth, minor third or whatever. In the Equal temperment system, this is true; in the complete world of nature, it is not.

Thus it can be seen that Equal temperment is but one possible system of organizing the sizes between pitches. Throughout history men have designed their own systems using the concepts of string part ratios that the model of a divided string provides.

While one can divide a string into parts in order to develop the ratios one needs, one can also combine ratios on paper in order to develop integrated tuning systems, since the result of adding or subtracting any two intervals will be an interval that could be developed by string-length manipulations on a monochord. In order to add two intervals, one actually multiplies their ratios. For example, the sum of two whole tones each in the ratio of 9/8 is a sort of major third with a ratio equal to the product of 9/8 x 9/8, that is 81/64. In order to subtract one interval from another one divides the ratio of the first interval by the ratio of the second. For example, the difference of a whole tone in the ratio of 9/8 from a perfect fifth in the ratio of 3/2 is a perfect fourth with a ratio equal to the product of 3/2 x 8/9, that is 24/18, which reduces to 4/3.

A very old example of how the addition and subtraction of intervals is used comes from the Pythagoreans of ancient Greece, who developed scales based on the 3/2 ratios. To construct a Pythagorean pentatonic scale like that in Figure 9, one would use the following process for developing the intervals:

FIGURE 9

1) establish starting pitch, C
2) tune the perfect fifth above C to get G
3) tune a perfect fourth below G to get D
4) time a perfect fifth above D to get A
5) tune a perfect fourth below A to get E

1) call this 1/1
2) multiply 1/1 x 3/2 = 3/2
3) multiply 3/2 x 3/4 = 9/8
4) multiply 9/8 x 3/2 = 27/16
5) multiply 27/16 x 3/4 = 81/64

The limiting factor in the Pythagorean system of tuning is the 3/2 ratio or what Harry Partch, an important 20th century figure in the development of intonation, called the "3" limit, in reference to the highest prime factor in the ratio terms. All ratios in the Pythagorean tuning, whatever the scale, are derived from the system of multiplying and/or dividing 3/2's, 4/3's and, of course, 2/1's. The highest prime factor in any term of the resultant ratios is 3.

By expanding the system to include 5 number ratios one can create a "just" diatonic scale. Figure 10 shows the result of the following process for developing the ratios:

FIGURE 10

THE HOW & WHY OF INSTRUMENT BUILDING

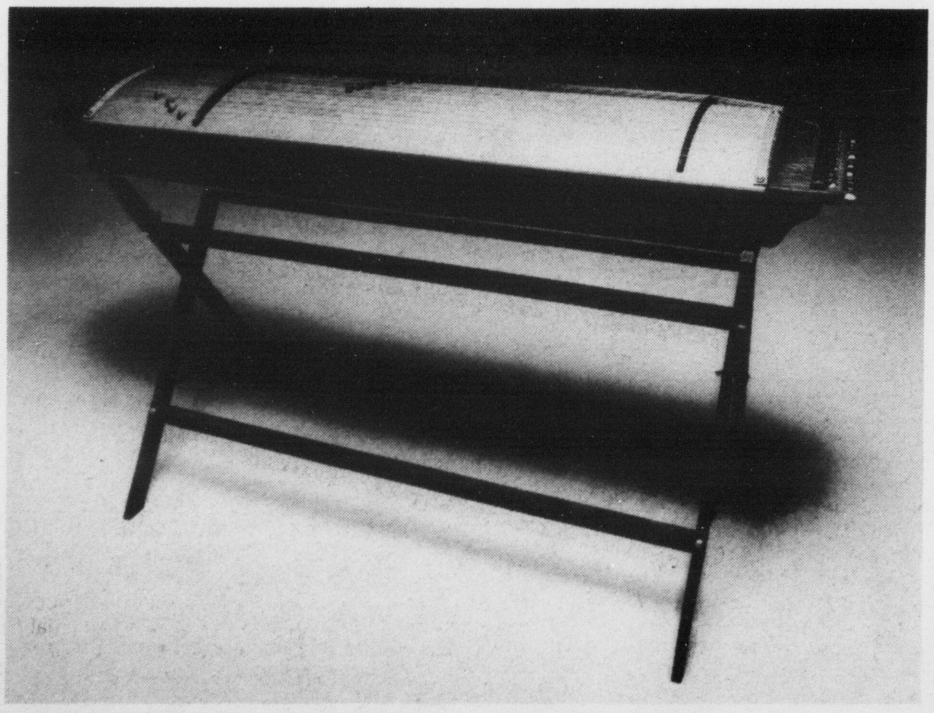
GAYLE YOUNG

The main reason I had for building my first instrument was my interest in pitch systems that are organized differently from the usual twelve tone equal tempered system. I had read of the various historical European tuning systems, just intonation and mean tone, but I had never heard them. I surmised that there might be some interesting audible distinctions between these various systems because the composers and musicians involved at the time certainly discussed them rather heatedly. I had also heard a lot of non-western music that made use of different pitch systems and microtones. I studied the acoustics and physics and theories about tuning and intonation, and over a period of several months, I developed a scale system with 23 pitches in each octave that I wanted to work with as a composer. It had several things I was interested in using: microtones, (interval sizes of 20¢, 40¢ and 70¢); simple intervals such as thirds, fourths and fifths tuned accurately in just intonation; and some possibilities for transposition. Now that I had designed the pitch system, I needed to hear it in order to decide from there whether it was useful to me compositionally. It was then that I decided to build a new instrument.

There are three general functions in an acoustic instrument and different materials are used for each: to generate the sound through a vibrating material such as strings or drumheads; to amplify the sound and spread it into the room through the resonator, the guitar belly or drum body; and to support and stabilize the instrument both internally and externally. Materials are selected for these parts depending on what sounds the instrument is intended to produce, high or low, clear or dense, a sound as close as possible to the ideal, produced by an instrument durable enough to withstand hours of hard playing, and some variation in the temperature and humidity of the environment. In most cases a compromise has to be worked out between the nature of the sound and the sturdiness of the instrument since too much support material can dampen the sound, particularly for delicate instruments such as strings.

For my first instrument I was looking for a material that would provide a clearly defined pitch that would not go out of tune. I would have to set the pitches by mechanical means, with a frequency counter, since I was not familiar with the sound of the tuning I was going to use, and would not have any direct way of knowing whether the instrument was in tune. I went to metal scrap yards where I selected a few pieces of various types of metal bars and tubing. After some experiments, I decided on 3/4 inch electrical conduit tubing, made of extruded steel. This material has almost a three octave range of sound at a good even volume level when the tube lengths are between 740 mm and 290 mm, and the finished tubes are of a reasonable size to make an instrument. To hear the pitch, the tubes are held at about 1/4 of their total length, at the node, to avoid dampening the sound. These node points are also used for mounting the tubes on the in-

Amaranth.



PETER PATERSON

Columbine.

PETER PATERSON

1) establish starting pitch, C
2) tune a perfect fifth below C to get F
3) tune a perfect fifth above C to get G
4) tune a perfect fourth below G to get D
5) tune a major third above C to get E
6) tune a perfect fourth above E to get A
7) tune a perfect fifth above E to get B

1) call this 1/1
2) multiply 2/1 x 2/3 = 4/3
3) multiply 1/1 x 3/2 = 3/2
4) multiply 3/2 x 3/4 = 9/8
5) multiply 1/1 x 5/4 = 5/4
6) multiply 5/4 x 4/3 = 5/3
7) multiply 5/4 x 3/2 = 15/8

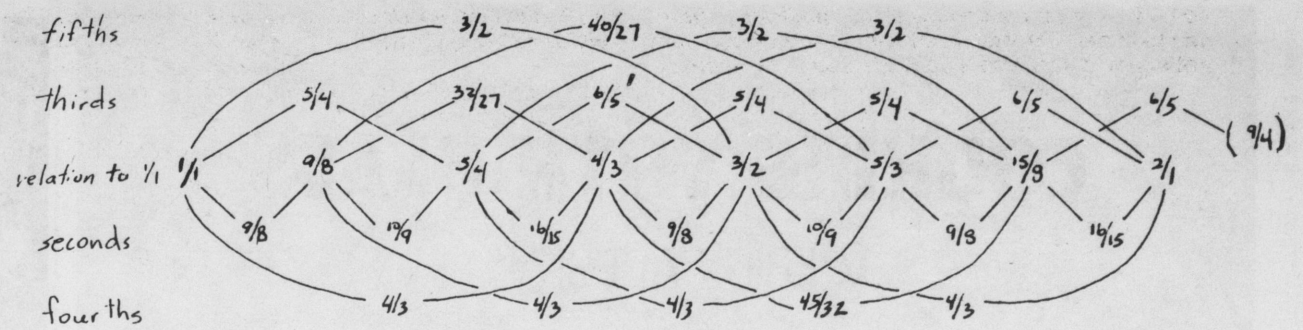


FIGURE 11

The term "just" refers to intervals with small numbered ratios. These ratios are easiest to hear because they simply involve the elimination of "beating" between the fundamental and the new pitch to be ascertained. Thus, to tune an instrument like for example a piano, according to a tuning system like that in Figure 10, one would simply follow through the steps of the ratio derivation. To find 4/3 or F, one would tune the F string to be a perfect fifth below the 2/1 C so that no beating occured. To find 3/2 or G, one would tune the G string to be a perfect fifth above the C string so that no beating occured. Then the D string would be tuned a perfect fourth down from the G string so that no beating occured, the E would be a major third without beating in relation to the C, and so on. For checking the accuracy of the ear and also to tune more difficult ratios, the monochord is invaluable. Monochords are relatively easy to make and can also be purchased from monochord builders like Lou Harrison and Bill Colvig.

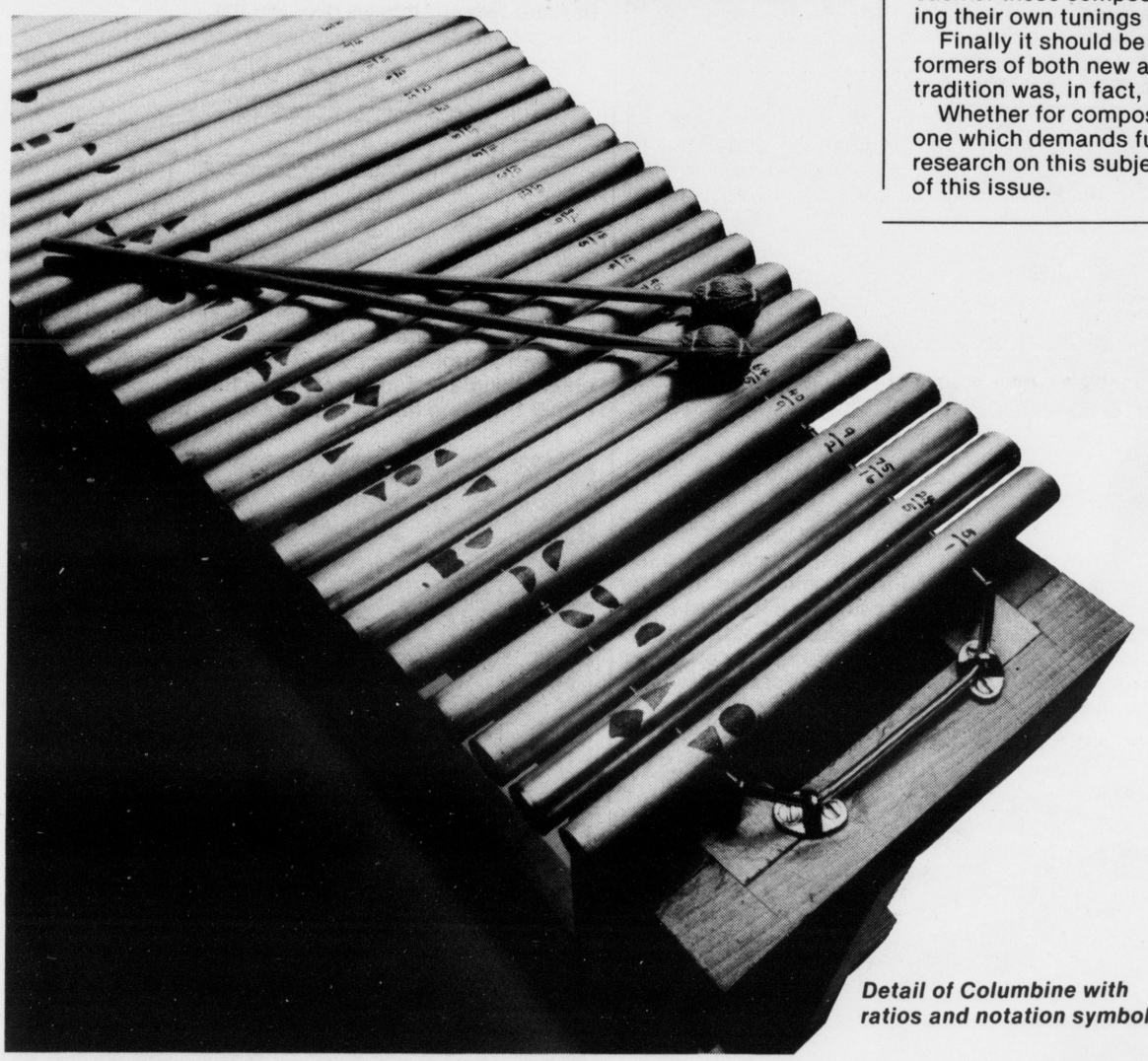
This way of calculating ratios can also be used to analyze the harmonic potential of the scale produced in Figure 10. Figure 11 shows the various relationships between notes of the scale. We see, for example, from this analysis that a minor triad built on the D note would be noticeably different from other triads generated from the scale since it has a small minor third of 32/27 and a small perfect fifth of 40/27. One might choose to exploit this aspect of the scale or conceal it by not using the chord depending on one's intentions.
pitches could be added to the scale. Their relationships to 1/1 would be 9/8 x 6/5 = 27/20, and 9/8 x 3/2 = 27/16. On a piano these notes would be introduced by using one of the unused keys like F sharp and tuning its strings to 27/20 and tuning the A sharp to 27/16. Thus in this new scale two D minor triads would be possible. It is important to keep track of the entire constellation of relationships between notes of a scale in order to determine its potential and if necessary to modify its structure in some way to make it most useful.

One can choose any group of ratios to base a tuning system on. One reason for logically developing a system is so that one can control the harmonic results. There are many different possible C minor chords available depending on the tuning system being used. Further to this, by increasing the number of ratios in a given scale, one can utilize different C minor chords, or whatever, within one tuning. Also, when there are large numbers of ratios involved, the distance between adjacent intervals can become quite small and varied, providing a rich chromatic field to work with. The harmonic richness afforded by a 43 note scale was an important motivation for Harry Partch to design such a system. To achieve this scale Partch included ratios within the "11" limit, ie., ratios involving prime factors up to and including 11.

Despite the general lack of knowledge that most musicians have about intonation, its history is a rich one. Harry Partch, who has been mentioned several times in this article, has been almost single handedly responsible for initiating concern for intonation in our century. His work as a theorist and composer has inspired a group of composers actively concerned with tuning. Just a few of these include James Tenney, Ben Johnston, and LaMonte Young, who have written for new tuning systems on traditional orchestral instruments, Gayle Young, who has designed her own scale and built instruments for that scale, Lou Harrison, who has written special tunings for orchestral instruments, but also has designed new instruments based on Javanese models, and other composers of importance. The compositional styles of each of these composers differ greatly, but their common interest in designing their own tunings makes them one group.

Finally it should be noted that intonation is of great importance to performers of both new and old music, since much of the music in the Western tradition was, in fact, written for something other than Equal temperment.

Whether for composer or performer, the area of intonation is a very rich one which demands further exploration. Book titles pertinent to further research on this subject can be found in the general bibliography at the back of this issue.



PETER PATERSON

Detail of Columbine with ratios and notation symbols.

strument frame. I devised a mechanical means of mounting the 61 tubes, strung on a wire and suspended from handmade brass posts above the hardwood frame. I attached a resonator built in a trough shape since the metal tubes are too close together to accommodate individual resonators. I named this instrument, *"Columbine"*.

A few years later, I designed a second instrument, the *Amaranth*, on which the tunings could be changed. I used strings this time because they provide the most practical methods of changing the pitch either by adjusting the tension on the strings with tuning pegs, or by altering the lengths of the strings by placing movable bridges under them. I fashioned several different types of bridge to enable me to set accurate pitches on the instrument. The resonator was made of clear sitka spruce, a traditional material used for guitar tops. The instrument is designed with a curved top so that the performer can bow one string at a time.

In the practical design of an instrument, attention should be given to the playing techniques that a performer will use. If these are kept close to traditional techniques for percussion, keyboard, strings, etc, (the new instrument will be reasonably simple for other people to learn to play.) The size of the instrument can be scaled to fit the techniques used with regard to hand size, arm length and the total reach and height of a performer standing or sitting at the instrument. Coupled with playing technique is notation technique. Will pitch, various playing techniques and different areas of the instrument be indicated to the performer? If so, how will they be notated?

If the instrument will have to travel to different locations for performances and recording sessions, it should have a fairly easy assembly routine and come apart into compact sections that can be carried in a small vehicle. Wing nuts and bolts can be used with interlocking joints made of wood and metal to give stability.

Careful design work is sometimes necessary to avoid unwanted noises. A piano, or just about any other instrument, has a characteristic noise that is recognized and accepted as part of the instrument's sound. Often you will not find out just how these accompanying noises will sound until the instrument is finished. Depending on the musical context, the vibrations, clunks and rattles may be unacceptable. In this case, much patience is required to adapt the instrument. Keeping the possible problems in mind during the design stage will help avoid these problems.

If the instrument is going to be amplified, or the sounds treated electronically, a method of picking up the sounds either through air mikes or contact mikes, or a combination of the two, has to be devised. It may take some effort to find the ideal placement for the mikes to get a good representative sound and to ensure that the performer won't hit the mikes by mistake while playing the instrument. In most cases a few sound holes can be cut into the resonator while the instrument is under construction.

If you are building an instrument that has never been built before, there is a certain risk that when it is finished, it won't sound quite the way you had hoped it would. But part of the reason for building a new instrument is to find out how it sounds. In any true experiment, the final result is not known until the whole process is complete. However, the risk and expense can be minimized by careful research work and the study of similar projects carried out by others. Two books that I found helpful while I was planning and researching the Columbine and Amaranth are *Sound Sculpture*, edited by John Grayson, which shows several examples of sound sculpture and the materials used in them, and *Genesis of Music* by Harry Partch, (probably the most important innovator in the theories of intonation in music, composition and instrumental design) which focuses both on the materials used for Partch's instruments and on detailed explanations of the pitch systems used for each one. In the larger libraries there are books about musical instruments, about bowed stringed instruments, or recorders, or percussion instruments, that detail their historical development and the materials used as well as such useful information as the acoustic function of the bridge of a stringed instrument the changes in timbre that are caused by different bowing positions. *Interval*, a magazine produced in California, has published many articles both on different tuning systems and on the acoustics of various materials used for building instruments. Unfortunately, I have found it hard to get copies, and have not yet found it in a library. Their address is P.O. Box 8027, San Diego, CA 92102.

In addition to the creative ideas and the detailed research work involved in the design of a new instrument, the mechanical aspects of accurate tuning, detailed carpentry, metal work, etc. present a further challenge, one which I have not discussed here. Linking the creative ideas with the practical aspects like carpentry and metal work requires an imagination that can visualize in three dimensions, the various parts of the instrument and the way they will fit together to form the completed whole. However, there is no need for one solitary person to do it all alone. If you are inexperienced in any aspect of the process, collaborate with someone who can help you out. I had help from several people and it was invaluable. Harry Partch had help too.

COOKING WITH GLASS

V. ERIC CADESKY

This article focuses on my experience of building glass musical instruments to provide ideas for others who are interested in building musical instruments. I have been designing and building musical instruments for ten years at this writing. For the last five years I have been building instruments solely of glass.

My interest in building instruments was due largely to the influence of the late Michael Craden who was an artist and musician and teacher. Michael built musical instruments when he was working with Harry Partch and later with the percussion ensemble Nexus.

I remember that Michael would react to an instrument I had built by setting it down and walking around and around it and looking at it for what felt to me in my eagerness a long time. I just wanted to get down and play it for him but he wanted to look and ask questions about it. His approach to making instruments would stress the artistic integrity of the instrument as a whole. How well is it built? Is it cluttered with the superfluous and unfunctional for the sake of design? Can it be improved? Is it finished? How does it sound? Is there another way it can be played aside from the obvious?

The saying "Form follows function" was one of my early guides. I still derive great pleasure from building an instrument with clean lines and well thought through design but still showing the human element in the finished product.

My first instrument was very big on the human element. I took a ten foot long 1/2 inch diameter copper pipe and cut it down to about 8 to 10 inch lengths. I suspended these pipes with elastic bands from a very crude 2 inch by 2 inch wood frame that could barely stand up. The wood and pipe were unpainted and the frame had nails sticking out every which way but did that sucker ring!

There are a number of informative books available on instrument building and hand-made instruments. Reading about musical instruments from other cultures past and present is also worthwhile. But learning by doing provides invaluable insight into what can and can't be built and why. It's also a fine way to learn about the basic acoustic properties of different materials; something that, for me, would not click by just reading about it from a book. So let's get on to glass.

FOUND INSTRUMENTS

One of the reasons I make glass instruments is that I perform with an ensemble called the Glass Orchestra, so named because all the instruments use glass in various forms to produce sounds or modify them. The first instruments we used were what I call "found" instruments — namely those pieces that required little or no modification to produce sounds: bubble bowls, glass bottles and jugs, brandy snifters, marbles, test tubes and fishbowls are some of the instruments in this category. One of the ways that wine glasses were chosen was to test them in the stores by either striking or rubbing a wet finger around the rim to elicit the sustained tone that most wine glasses will produce. Occasionally this was met with disapproval by sales staff in certain stores that shall remain nameless (Eaton's...) and we were asked politely to leave.

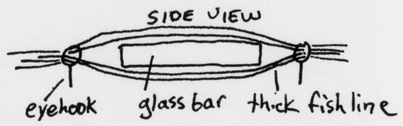
If a number of wine glasses are fastened to a table or box, both hands are left free to bow (short form for finger bowing or rubbing a wet finger around the rim) more than one glass at once. Water at various levels in the glasses will change the pitches of the glasses. The more water you add to a vessel the lower the pitch will be. This is because the water slows down the rate of vibration of the glass. Tilting a glass with water in it while bowing it will bend the pitch. (better still use gin.)

GLASS MARIMBA

The glass marimba has gone through several design changes over the years. Originally it consisted of seven glass bars cut from window glass resting on a wooden resonator box. The largest bar was 12" x 5" and the smallest was 7" x 3". The lower notes worked best when cut from a thinner glass than the higher notes. I am still experimenting with length times width times glass thickness ratios to find some form of guideline for choosing notes. If you are going to build this instrument then I would suggest you experiment too, as there is no hard and fast rule for choosing the notes you want. When I cut the original bars I tuned them by ear rather than attempting to duplicate any existing scale.

When your bars are cut, grind or sand the sharp edges smooth as they have a tendency to cut through the suspension system when the bars are played upon.

The present suspension system consists of two sets, each of four stands of clear fishline. These sets run along the top length of the resonator box on either side. The glass bars rest on the fishline at their nodal points. (generally one fifth of the way in from each bar end) On each set, two strands of fishline go under the bar and two strands go over the bar.



To prevent the bars from sliding away from the player I use very thin fishline looped over the end of each glass bar and tied to the eye hooks.

A word about resonator boxes; I made them from clear plexiglass and simply put a flat bottom on them, rather than fine tuning the bars to the boxes and sloping the box bottoms to the proper angle as in orchestral marimbas and xylophones. I have found that this resonator box makes the sound loud enough in the context of other glass instruments.

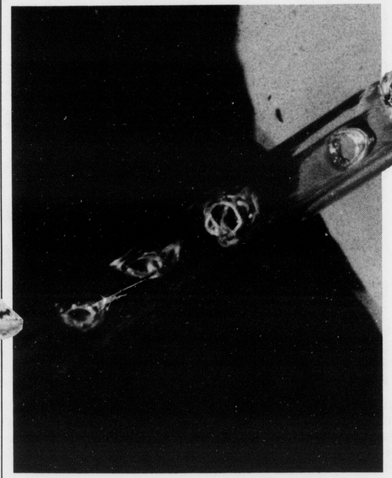


PLATE GLASS GONGS

These are pieces of plate glass that were cut to sizes around 9 inches by 12 inches. Sometimes I would cut the corners off some of them to see how it would alter the sound. I would also drill holes in them so that they could be suspended.

I built an instrument called Spring and Fall which consisted of five or six of these gongs suspended over a trough of water. The bar that the gongs were hanging from was in turn suspended by spring-like material that stretched so the gongs could be lowered into the trough of water and hence lower the pitch of the gongs. Curiously enough if the gongs were cut exactly square then there would be no sounding of the fundamental pitch, just a few of the harmonics; but the slightest deviation to rectangle would bring out the fundamental pitch clearly.

PHOTOS BY VID INGELEVICS

CIDER JUG GONGS

These are interesting to make because of the way that the jugs are cut. First you scratch a line completely around the jug with a small file where you want it to be cut. Then you wrap a wire from a hot plate around the scratch and let it get hot. Remove the wire and quickly immerse the jug in a tub of cold water. The sudden shock and contraction usually breaks the jug where you want it but again, not always. Glass has an unpredictability and temperament all its own (the scars on my fingers attest to this).

In the Glass Orchestra we are all resigned to the fact that everything we own will break. Although there are pieces that have been around for years that have put up with a lot of percussive punishment, all that it takes is the right stroke at the right moment and you suddenly own two or more new instruments. The resulting uneven break alters the harmonic structure of the new pieces so you may be left with some wonderfully rich sounding instruments. Other quirks that I have found include wine glasses with two or more tones sounding when the glasses are bowed. The pitch oscillates back and forth like an ambulance siren. I have discovered this anomaly in expensive crystal and regular wine glasses.

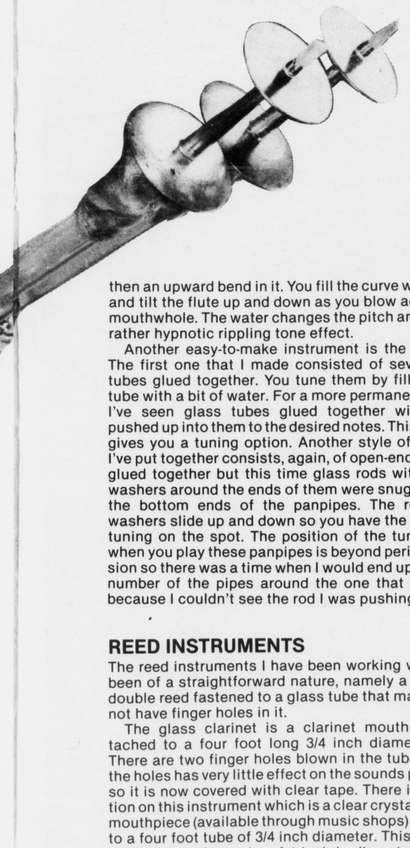
WIND INSTRUMENTS

Flutes are relatively easy to make out of pyrex tubing. Most of the flutes that I have made are out of 3/4 inch diameter tubing but I have worked with tubing as large as 1 1/2 inches.

Finger hole placement decisions were usually based on what I had not previously tried, so in my collection the flutes have between three and seven fingerholes. They are all transverse flutes although I have experimented with end blowing.

One flute I have is 1 1/2 inches in diameter and 24 inches long. I've bent the flute body downwards to see if it would be more comfortable for the right hand (it is) and to see how this bend would affect the sound (very little effect).

Another flute that is the result of many experiments is the Water Flute. This flute is 3/4 inch in diameter and 14 inches long. It has one hole in it which is the mouthhole. The opposite end of the flute has a downward then an upward bend in it. You fill the curve with water and tilt the flute up and down as you blow across the mouthwhole. The water changes the pitch and gives a rather hypnotic rippling tone effect.



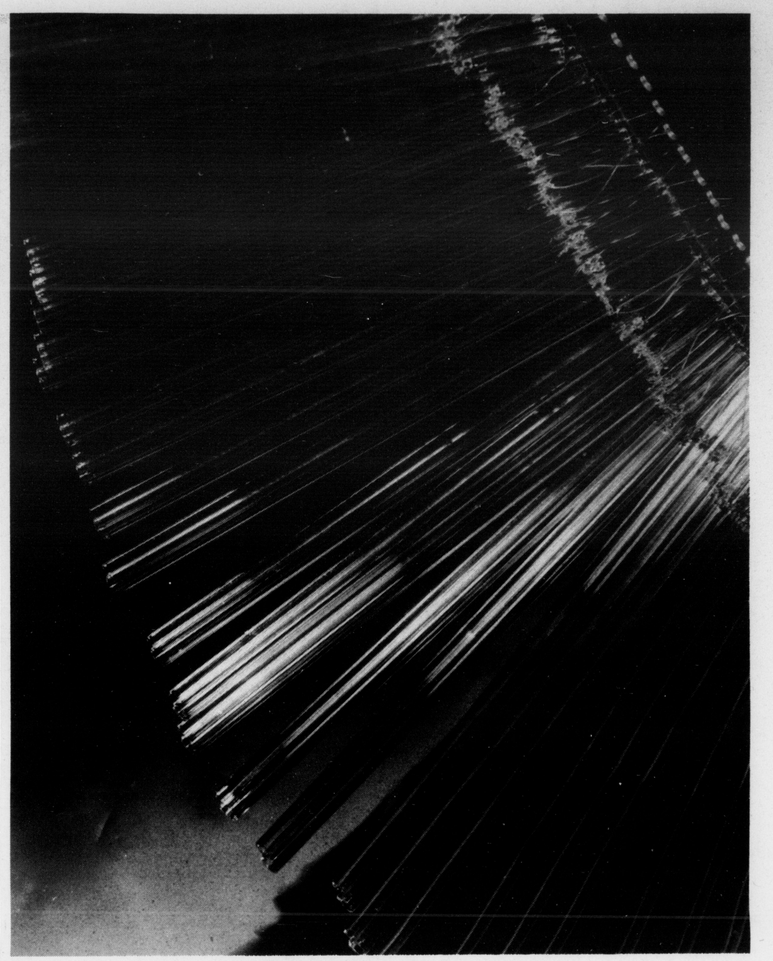
Another easy-to-make instrument is the panpipe. The first one that I made consisted of several test tubes glued together. You tune them by filling each tube with a bit of water. For a more permanent tuning I've seen glass tubes glued together with corks pushed up into them to the desired notes. This method gives you a tuning option. Another style of panpipe I've put together consists, again, of open-ended tubes glued together but this time glass rods with rubber washers around the ends of them were snugly fit into the bottom ends of the panpipes. The rods with washers slide up and down so you have the option of tuning on the spot. The position of the tuning rods when you play these panpipes is beyond peripheral vision so there was a time when I would end up tuning a number of the pipes around the one that I wanted because I couldn't see the rod I was pushing.

REED INSTRUMENTS

The reed instruments I have been working with have been of a straightforward nature, namely a single or double reed fastened to a glass tube that may or may not have finger holes in it.

The glass clarinet is a clarinet mouthpiece attached to a four foot long 3/4 inch diameter tube. There are two finger holes blown in the tube. One of the holes has very little effect on the sounds produced so it is now covered with clear tape. There is a variation on this instrument which is a clear crystal clarinet mouthpiece (available through music shops) attached to a four foot tube of 3/4 inch diameter. This tube fits inside a four foot tube of 1 inch in diameter. As you slide the smaller tube in and out of the larger tube you get a trombone type effect. Eight feet of tubing gives you quite a low note.

The Slide Pookaphone is interesting because it is the reed that moves up and down the length of the tube. The basic instrument is a four foot long tube with a duck call reed in it. I hold the tube above me straight up vertical and blow into it. As the reed rises up the tube its timbre changes. This is a somewhat dangerous instrument: Once I needed to take a breath when the reed was at the top of the tube and naturally the reed came down the tube at a rather fast pace and split my lip. Since then I have been practicing my circular breathing.



GLASS ICICLE CHIMES

I like to suspend lengths of 1/4 inch or so diameter tubes in ascending order of length from clear plexiglass forms. The sounds from these chimes are delicate and dry. The tubes should be spaced as close together as possible without having them touch. I blow a tiny hole on each side of the tubes about 3/4 of an inch from the tops and use clear thin fishline to suspend them.

GLASS BELLS

If you are fortunate enough to know a glass blower you can get glass bell forms made for you. I commissioned a number of these forms with the request that a small hole be left at the top of the bell so that I could string a clapper through. I made the clappers from pyrex rod.

So what else can you do with glass? This brief article was to offer you some ideas that have worked for me. There is still a lot of potential for glass instruments and I feel that even after five years of work that I have barely scratched the surface. For me some of the joy of doing this work was the result of learning glass working techniques. Something else that I should tell you is that all these instruments that I have described are the results of revisions and experiments, some of which were not too successful. If I'm not happy with the direction an instrument is taking I leave it for a while. I've been developing ideas for a glass thumb piano for 2 years. Glass clarinet ideas have been growing and changing for 4 years now. If you like to build instruments then I would tell you to have patience and to trust the cycles of your intuition.

oink

If you want to hear the sound of glass instruments on record or tape, contact the Glass Orchestra, 81 Portland Street, No. 303, Toronto M5V 2M9.

THE TRUTHSEEKER COMPANY
(THE ? IS OUR CORNERSTONE)

Naked, floating in the warm fluid of an isolation tank, the entire time line of my life appeared to collapse into a few basic images. Six, sixteen or sixtyfive, who cares. All the way through we sneeze, create and satisfy our curiosities in the same characteristic manner. I was to give a talk at the vernisage of my People Participating Seisometer at the National Gallery in Ottawa and I realized that these images had to be my topic in the darkness of that tank. The following is from that talk.

Bart Van Der Lek, Gerrit Rietvald, Maybe Van Tongerloo and a few others, and certainly our good family friend Piet Klaarhamer, all artists and architects, members of the De Stijl movement, would at times come together at my father's studio. That was about 1927 in the middle of the city of Utrecht in Holland. My father did not sympathize with their philosophy but friends are friends and he was a good host. When the air was filled with cigar smoke and the smell of Dutch gin, I would sneak in and sit in a little corner to listen to their deliberations. They could save the world from its evil ways by the power of their straight lines and primary colour patches. They would pronounce, bless and excommunicate, and they had knowledge of some superior reality as it existed in the mind of the godhead and that, of course, was very exciting to listen to for an incipient truthseeker.

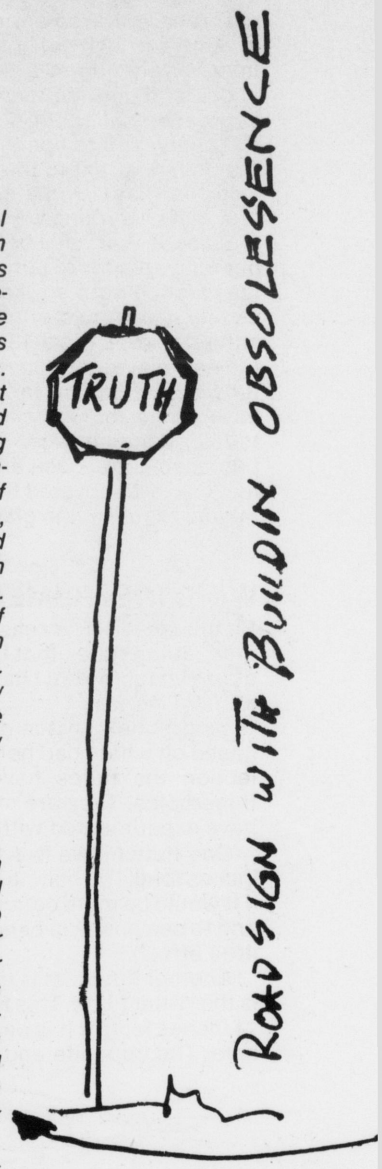
I had seen Calvinist farmers in Holland huddle together to interpret holy scripture; pinpointing the meaning of every word onto the needle cushion of their fundamentalist system. In a similar manner these artists dealt with their Neo Platonic views from the philosopher Schoenmakers. I remember quite a bit from their heated discussions but one thing stood out clearly and with which I decided to disagree profoundly, and that was their unbound admiration for what they called "la realité pure." (For some reason they always said that in French...) As I had developed an early interest in girls I opted for its counterpart, the nice and sinful reality. But whatever my opinions one could sense that so much conviction right or wrong must have its impact on history.

Another memorable event happened on the Bodensee in southern Germany in view of the alps. There on a hill in the midst of vineyards was "Birnau." We boys would love to go to that church not only to look at the scantily clad angels and goddesses with their beautiful boops that were floating around on the ceiling of this majestic baroque church. One of the goddesses in the entourage of the Queen of Heaven, I think it was Palas Athene, had a mirror in her hand as a symbol of wisdom, and we knew where to go to see our selves way up there in the company of these supernatural creatures and these gorgeous beings. Those Jesuits of the Counter Reformation knew how to have a finger in various cultural pies and to concoct in it some grandiose vision for their war against puritanism. There was something attractive about all this.
Even Jesuits were preferable over puritans.

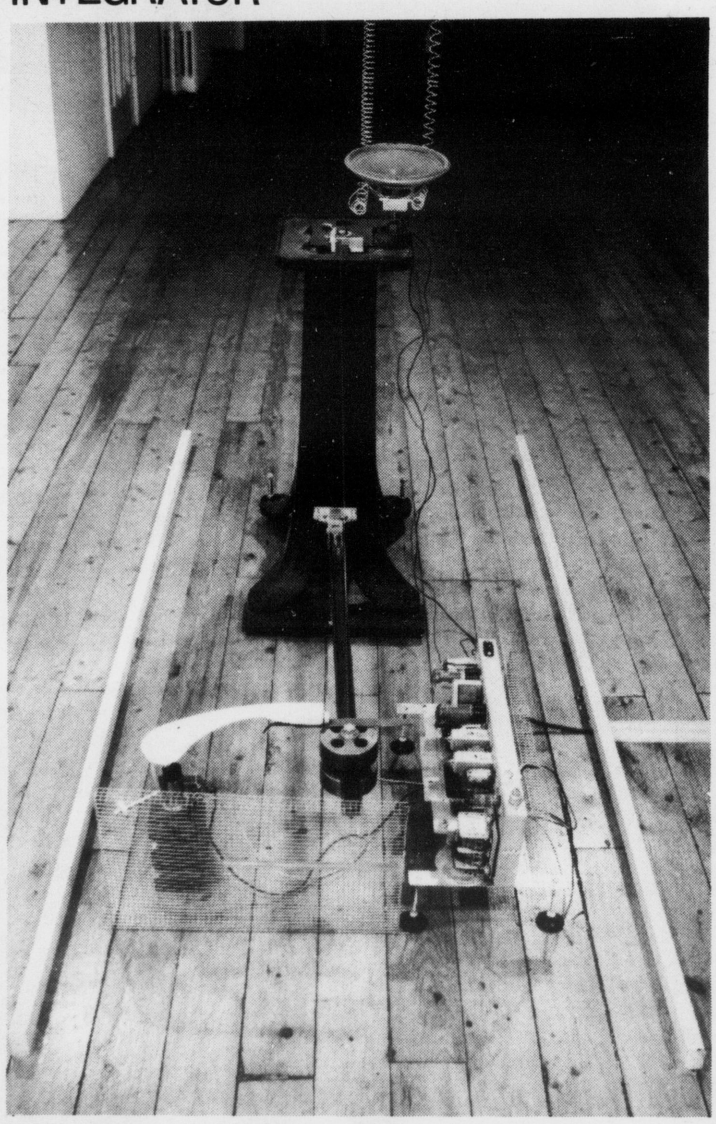
There is also the image of the geologist who came to visit us. He was a square and stocky fellow with an awfully stern face. He stayed with us while he was doing field work on the northerly alpine formations. I must tell here that my parents did not believe in schools and they tried to persuade him to take some of us along with him in the field as a better way of learning, to which he grudgingly agreed.

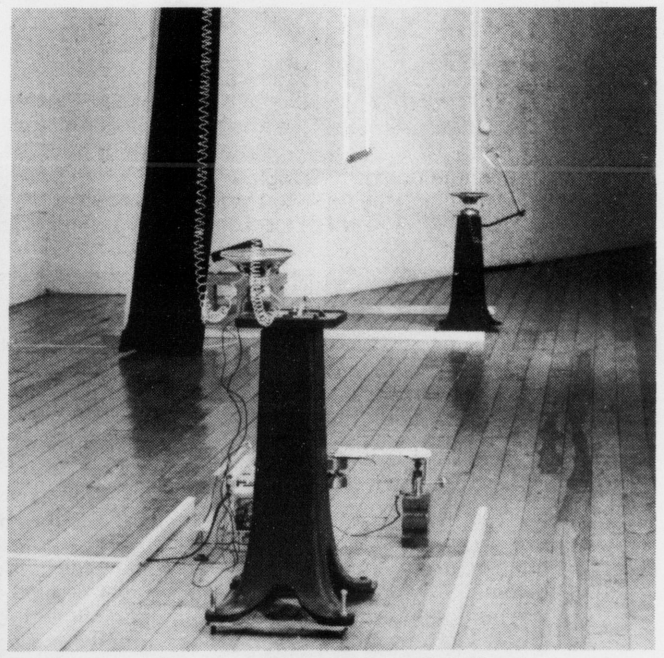
Once in the field however and impressed, I think, by our sincere curiosity he became an excellent teacher. He would tell us that his thesis, or his big assumption, was that tremendous masses of rock had slid off to the north while the main body of the mountains were pushed up through immense pressures. He was always very careful to point out that he had only a tentative concept in his mind which he tried to verify or disprove according to whatever the facts or findings may tentatively justify. He would chop off a piece of rock, look at it through his magnifying glass, measure chrystal size and orientation and then we would run some 7 or 10 miles through valleys and streams and find another crop. Again his hammer would come out to chop off another piece of rock which he would then again carefully investigate and compare. Then he would squint his eyes and say; may be... may be...but there has to be a lot more work done before this can be known with any degree of certainty.

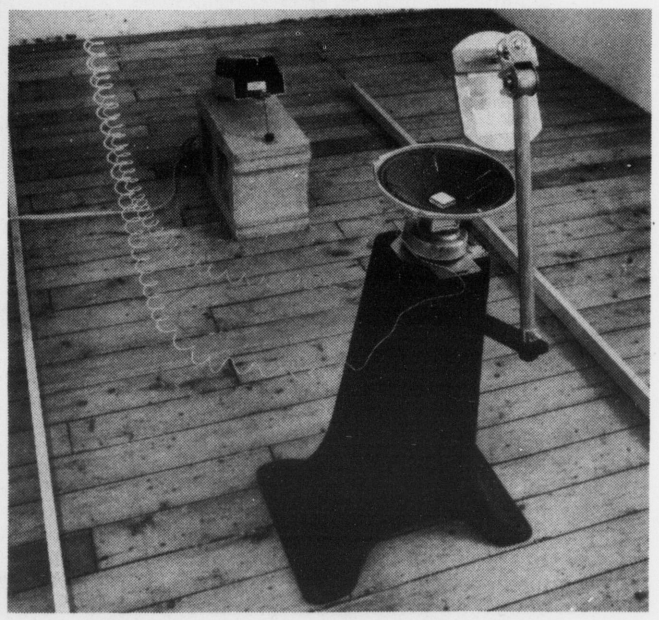
Here was a man that had no direct line with divinity. He took reality as sinful as it was and looked it straight in the eye waiting for it to answer in its own way. No queen of heaven or religious oneup-manship, no verticals or horizontals or yin and yang or primary colours and karma, only drab pieces of rock, a magnifying glass and a hammer. Later these rocks would rest in our basement carefuly marked catalogued and numbered. The image I saw in the soundless depth of that isolation tank was me staring at those rocks.



PERPETUAL DEPENDANCE INTEGRATOR







"No discipline can justify itself by its own methodology or systems." (Kurt Gödel)

Whether this applies to all human activities is a matter of conjecture but it can be investigated. The question is posed in the form of instruments arranged in the gallery. A tone arm, quivering on the mass of a slow moving horizontal pendulum translates the motion of the visitors into sound patterns, as allowed by the characteristics of the instrument. The rhythm thus created incites the visitor to dance which in turn feeds back into the system. An other instrument functioning in series creates visual patterns, again begging for response.
These various feedback-loops can also be experienced as holistic correlatives of games mathematicians play with what they call "strange attractors" and functions trying to describe the gray area between chaos and order. The input and the arrangement can be varied at will to study: rhythm; communication; seismicity; music etc. etc.

Reality is a consensus not a constant.

What we have learned about the universe through inductive methods over the last hundred years has been formulated by physicists and mathematicians but it has not entered into our consensus. We do not really live in the world we know exists.

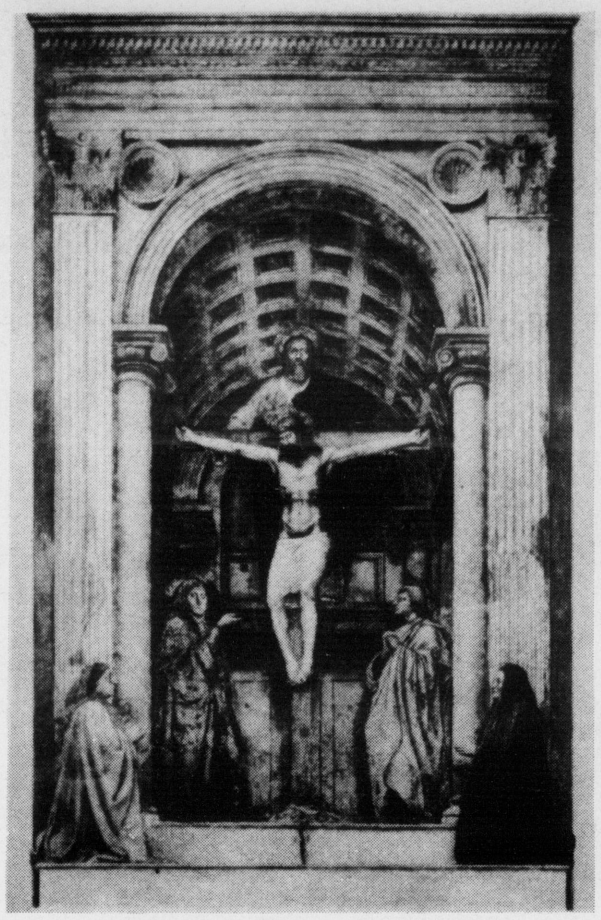
Traditionally artists have changed and recreated the content of that consensus, even such basics as our perception of space and time. This can be demonstrated, I believe, all through history. To mention the renaissance transition: If such people as Masaccio had not simplified the utterly complex space awareness of the medieval "Oikoumeme" into three controllable dimensions, the development of modern man would be completely unthinkable. After Masaccio had painted his Blessed Trinity at the Sta. Maria Novella in for Gallileo's experiments, for Newton's mechanistic universe and for photography to become an acceptable manner to represent the world around us. In fact the influence was so total that it has blocked our senses from evolving with our ever increasing knowledge.

People in the early Renaissance had done what we do so often in daily life. When we attempt to see better, we single out something as important, worthy of our special attention. Historically this amounted to the making of a new consensus. Within this new reference system people could then organize their curiosity. But this sort of consensus is much deeper than simply mutually agreeing on something. It alters the very cell-structure and passageways in the cortex of our brain. It alters our perception. Perception is a matching process of ingrained notions we have stored, with the overwhelming wealth of incomming information and we can only see, hear, feel etc. in terms of these notions; notions, to a large degree coined by the pervading consensus. It makes life possible, but at the same time we are trapped in our own pigeon holes.

I am fascinated by the possibility of unlocking our senses.

Maybe this can be accomplished by the same sobre inductive methods of controlled experimentation, but in a new form which cannot be *described* because it was mainly the Gutenberg volcano that spewed the ossifying lava. Art takes over where philosophy leaves off. "Art" may be the wrong word to use here but on the other hand one must consider that since Cézanne, the main stream of artistic development can be seen as a series of revolts against Renaissance three dimensional space. By the way, that started at the time Einstein was born!

When I had my People Participating Seismometer set up in the Mercer Union Gallery in Toronto somebody remarked that this whole reenforced concrete bunker changed into rubber after he had watched for a while how the light on the wall changed its position with every step he made.



SCIENCE MUSIC TECH. PSYCHOLOGY PHYSICS MATEMATICS ART ETC. ETC.
how useless as reference systems.

Is the penis a convincing phallus symbol? I am fed up with metaphors. All that big important bullshit about art gets on your nerves. We haven't put things together. Maybe for good reasons we are relegated to the fringes of society, and have no influence on anything whatever, not even metaphorically. Let's expand into what is real. Let's make things, instruments, machines, that make you see new things. Is nudism bad for sex?

15 years as some sort of Hippy in South America was exciting. But one year with hard a nosed scientist in Canada sometimes more so.

IMPORTANT

The "Perpetual Dependance Integrator" is a swing sieve. It converts random swinging into patterned swinging by inhibiting the swinging that does not fit the natural frequencies to which the instrument is tuned. How can we say that a contemporary conception of matter is devoid of all sensory qualities if we know little of how our sensory system sieves information? Where does a sieve become a thief?

I guess it's better to start sane and sober — reality is crazy enough.

Music is full of pendulous affairs. Certainly metronomes, but even fingers, hands and drumsticks have their natural period, their own unique way of swinging. Rhythm is mental swinging, a matter of motion, inertia and balance. I would like to know if the difference between beat and rhythm could be compared to the difference between classical, mechanistic physics and modern relativistic physics. In the latter is a sense of indeterminism, a sense of freedom. Solar winds and magnetic fluxes swing. Make love to the rhythm of the Auroras, it's research.

Sanity is flexibility. It is nice to have a clean and flexible ear to listen.

When the prime minister puts up his finger we know exactly what he means. It is undiplomatic, and non literary, but its meaning, its sense is undeniable.

The insistence that *sense* can only be expressed in words was the pipe-dream of the Gutenberg Galaxy. Gutenberg, the inventor of the printing press was some kind of an artist and isn't to blame for it, but the usurpation of expression by linear thinking was closely linked to the view that space was only three dimensional. Freedom becomes oppression. A Galaxy becomes a layer of lava.

It is tough to live in harmony. A house with a rational layout, where every door and window is in a predictable place, is an insult to creative characters. We urgently need rythmically randomised architecture.

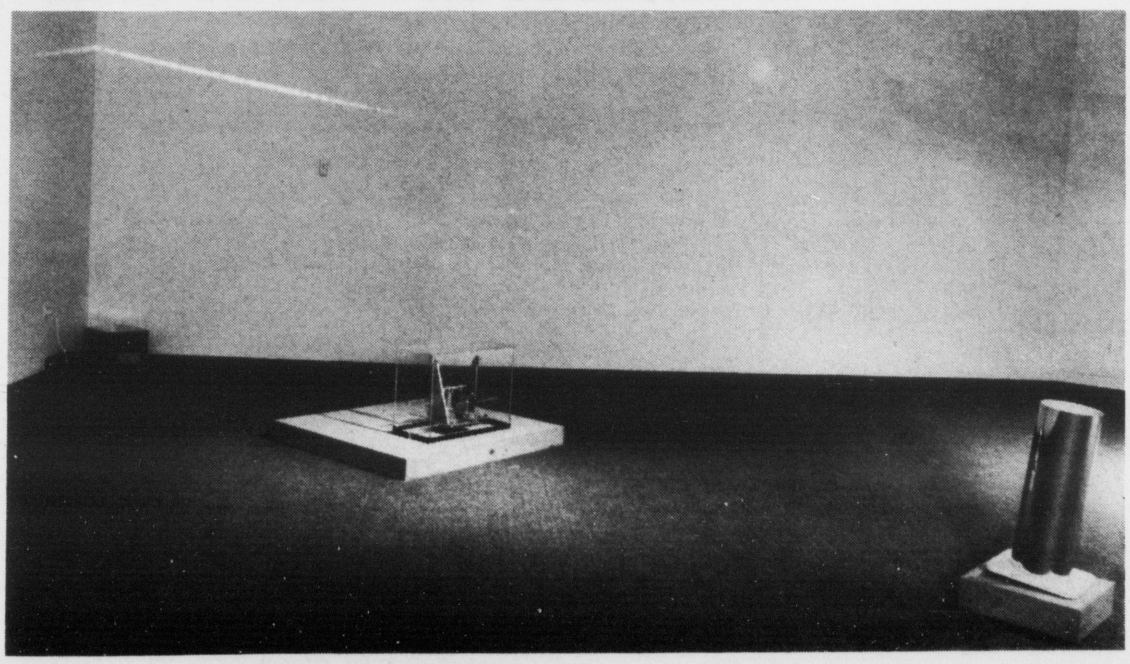
If the Big Bang theory is correct, why is the starry sky such a mess? The universe is not all that mechanistic. I always suspect that often repeated statement that the findings of modern physics are not accessible to our senses. Why not?

In this entanglement of our nervous system, of axons and neurons and synapses, there are alot more messages inhibited than passed on. We may be historically and socially in the stage of a baby that tries to coordinate seeing and touch. There is no reason to believe that we are not a part of this universe and that we can't perceive it in its totality. It does not seem to be right that we can only perceive what is mechanistic.

In the framework of classical mechanics, the kinetic energy of any particle can never be negative: A pool ball at rest has zero kinetic energy. If I kick it in whatever direction, I give it kinetic energy. I can give it a little or I can kick it right over the rim onto the wall, but I can never give it *negative* energy. But in wavemechanics of modern physics events occur that could be explained as particles embued with negative kinetic energy. Things tunnel through where they are not supposed to go, et cetera, et cetera. In that world of probabilities, the statement, *''whatever happens MUST happen, and what does not happen CANNOT happen''* does not apply. I dont' care if that has anything to do with free will. What I'd like to say is that our nervous system does not seem to operate in a mechanistic mode.

And then there are a number of hints that we may have undeveloped latent senses: although the of our nervous axons systems are coated with polarizing material, we cannot distinguish polarized light. But bees and pigeons orient themselves by polarization paterns in the sky. Dogs and birds can sense the coming of an earthquake. What micro-seismic motions do they sense? What sound patterns? As an artist I am terribly interested in all that, and why not? Einstein himself evokes his artistic sensibility to explain his findings.

PEOPLE PARTICIPATING SEISMOMETER



JUAN GELER DID THIS DECEMBER 1982

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(Article referral designated by author.)

BOOKS

Biofeedback and the Arts: *Results of Early Experiments* edited by David Rosenboom. Aesthetic Research Centre of Canada, P.O. Box 3044, Vancouver, B.C. Canada V6B 3X5.
(Rosenboom, Teitelbaum, Kasemets, Geuer.)

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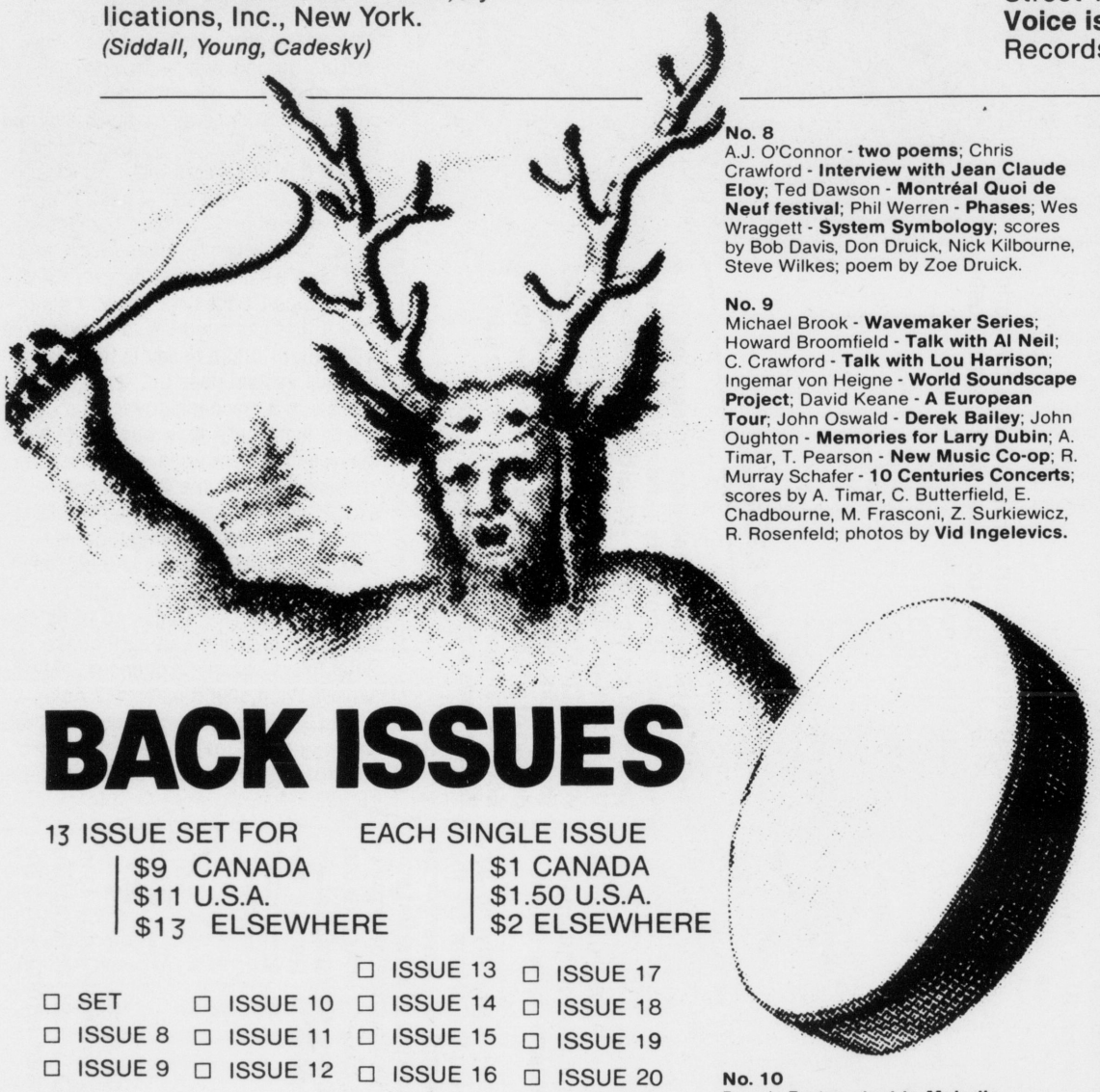
RECORDS

According; Gayle Young and Reinhard Reitzenstein. JWD Music 146 Ridge Road West, Grimsby, Ontario, Canada, L3M 4E7

The Glass Orchestra. Music Gallery Editions, 30 St. Patrick Street Toronto, Canada M5T 1V1

Voice is the Original Instrument, Joan LaBarbara. Wizard Records.



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A.J. O'Connor - **two poems**; Chris Crawford - **Interview with Jean Claude Eloy**; Ted Dawson - **Montréal Quoi de Neuf festival**; Phil Werren - **Phases**; Wes Wraggett - **System Symbology**; scores by Bob Davis, Don Druick, Nick Kilbourne, Steve Wilkes; poem by Zoe Druick.

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Michael Brook - **Wavemaker Series**; Howard Broomfield - **Talk with Al Neil**; C. Crawford - **Talk with Lou Harrison**; Ingemar von Heigne - **World Soundscape Project**; David Keane - **A European Tour**; John Oswald - **Derek Bailey**; John Oughton - **Memories for Larry Dubin**; A. Timar, T. Pearson - **New Music Co-op**; R. Murray Schafer - **10 Centuries Concerts**; scores by A. Timar, C. Butterfield, E. Chadbourne, M. Frasconi, Z. Surkiewicz, R. Rosenfeld; photos by **Vid Ingelevics.**

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Dennis Burton - **text to Melodie Conversion**; talks with **Yves Bouliane, Chris Crawford, John Oswald, Andrew Harwood, Sessione Milano, the Government, Peter Cussack, Andrew Timar, Victor Davies, Pauline Oliveros**; Wes Wragget - **Notes on Electronic Music**; Andrew Timar - **Kapilavastu.**

No. 11 SPECIAL DENNIS BURTON ISSUE
Scores, drawings, caligraphy, writings.

No. 12 SCORE ISSUE
Jonathon J. Bayley, Norma Beecroft, Stuart Broomer, Dennis Burton, Bill Buxton, Jon Celona, Graham Coughtry, Ted Dawson, Don Druick, John Fodi, Miguel Frasconi, Harry Fneedman, Raymond Gervais, John Hawkins, John Kamevar, Udo Kasemets, Henry Kucharzyk, Lubomyr Melnyk, David Jaegar, Jim Montgomery, David Mott, Al Neil, André Prévost, Jon Siddall, James Tenney, John Weinzweig, Phil Werren, Wes Wraggett.

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Al Mattes - **'Ear It Live in Toronto**; Robert Gelinas - **Ear View from Montréal**; Susan Frykberg - **The New Music Forum**; Andrew Timar - **A Talk with Philip Glass**; John Kamevaar - **Musicgraphics**; Gayle Young, Reinhard Reitzenstein - **Collaboration**; Jon Hassell - **Possible Musics**.

No. 14
Misha Mengelberg talks with Andrew Timar; Mendelson Joe Speaks; Gayle Young - **Hugh LeCaine**; Susan Frykberg - **The Computer Music Conference**; Chris Howard - **Making do in New York**; scores by Jon Siddall and Dennis Burton.

No. 15 WEST COAST ISSUE
Jon Celona - **Belief System**; Kenneth Gaburo - **seminar transcript**; Anthony Genge - **Note on my music**; **Sten Hansen's Meta Music Interview**; Russell Keziere - **Andrea von Ramm, Meredith Monk**; Michael Longton - **Composition after Technology**; Stephen Parkinson - **Acknowledging the Mind's Ear**; Jean Piche - **Electronic Music 1981**; Hildegard Westerkamp - **R. Murray Schafer, Wilderness Lake**; Donna Zapf - **Robert Minden, H. Westerkamp, The World Soundscape Project**.

No. 16 AN ATLAS OF CANADIAN SCORES
Sir Ernest MacMillan, Malcolm Forsythe, Phil Ogison, Steve Brown, Robert W. Stevenson, Mendelson Joe, Marjan Mozetich, Paul Theberge, R. Murray Schafer, Alexina Louie, Gayle Young, Miguel Frasconi, Clermont Pépin, Edward Arteaga, John Oswald, John Kamevaar, Micheline Coulombe Saint-Marcoux, Ted Dawson, Stuart Shepherd, Peter Anson.

No. 17 PIANOS/HUGH LECAINE/JOHN CAGE
Lubomyr Melnyk - **Continuous Piano Playing**; Al Neil - **How to Play the Piano**; John MacGregor - **Large Blue Piano**; Andrew Timar - **A Conversation with John Cage**; Casey Sokol - **Pushing the Limits**; Gayle Young - **Hugh LeCaine Part II**; Annea Lockwood - **Piano Burning**; Pablo Frasconi - **plant photographs**.

No. 18 MONTRÉAL
Raymond Gervais - **Sonorities**; Robert Rayher - **Non-Music**; Susan Frykberg - **Claude Vivien in Conversation**; John Rea - **Musicians/of Note(s)**; Otto Joachim - **Mankind**; Robert Gelinas - **De la Grande Depression a la Grande Deprime**; Chris Howard - **Nightkitchen, Electronic Music Studios**; C. DeMestral - **Sonde**; Micheline Coulombe Saint-Marcoux - **text**.

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Lisa Nelson and Danny Lepkoff — **Making Sound; Le Groupe de la Place Royale;** Ted Dawson — **Joint Actions**; Jennifer Mascall — **Music and Dance**; Stuart Shepherd — **Choreographic Seminar**; New Music Co-op — **Colliding**; Richard Lyons Dance Troupe — **Ojibway Dance**; David Mott — **Toward a New Mind/Body Music**; Udo Kasemets — **After Roaratorio**; Michel Lemieux — **Oranges**; Gabor Toth — **Dadacantata**; John Oswald — **Warm Wind Pressure and Aura**; — Andrew Timar —**Working with Dance; Musicdance Orchestra.**

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Charles K. Noyes — **Man, Animals and Music**; Pierre Ouellet — **Interspecies Music**; Iris Brooks — **Flutes and Animals**; Simone Forti — **Handbook in Motion**; Andy Warshaw — **Bodysounds**; David Mott — **Toward a New Mind/Body Music Part II**; Malcolm Goldstein — **Improvisation**; Jon Siddall — **Towards a Populist Music**; N.G. Thornton — **Consider the Idea of Sound.**

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January 2, 1983

Jean Piche: IN AND OUT OF THE RAINBOW, **Steve Reich** — — TEHILLIM; **Ragnar Grippe** — ORCHESTRA; **Gyorgi Mincheu** — PIANO CONCERTO; **Peter Sculthorpe** — MANGROVE.

January 9, 1983

SOCIETE DE MUSIQUE CONTEMPORAINE DU QUEBEC:
Giacinto Scelsi — ANAHIT; **Bruno Maderna** — PIECE POUR IVRY; **Paul Theberge** — JOMO; **John Rea** — TREPPENMUSIK.

Philip Glass — MODERN LOVE WALTZ; **John Thower** — VARIATIONS ON A BLUE THEME: **Francis Dhomont**; — POINTS DE FUITE. Performed by the *DA CAPO CHAMBER PLAYERS, CBC CONTEMPORARY CHAMBER PLAYERS.*

January 16, 1983

Viola recital by *RIVKA GOLANI-ERDESZ*: **Otto Jachim** — REQUIEM; **Ernst Krenek** — SONATA FOR VIOLA AND PIANO.

Music from the California Institute of the Arts Festival.

Music by **Vinko Globokar**: DISCOURS V, DISCOURS III, DISCOURS II, DISCOURS VI, DISCOURS IV. Performed by *HEINZ HOLLINGER*, the *AMSTERDAM SAXOPHONE QUARTET.*

Recital by *JAMES CAMPBELL, RUSSELL HARTENBERGER, WILLIAM AIDE.*

January 23, 1983

inNOVAtions in MUSIC concert from Halifax: **Steve Tittle** — MOURNING THE LOSS OF OUR DEMONS; **Wes Wraggett** — DHAR-MAKAYA; **Gyorgy Ligeti** — MELODIEN. Performed by the *ATLANTIC SYMPHONY ORCHESTRA.*

February 6, 1983

Piano recital by *KATHLEEN SOLOSE:*
Paul Ziolo — SYNTAGMA I; **Bentley Jarvis** — PIANO PROCESS; **Gang of Three** — PURPLE SHIRT.

February 13, 1983

Music from the California Institute of the Arts Festival.

February 20, 1983

Music from the Promenos Festival, sponsored by Dutch Radio: **Kazimierz Sorocki** — FANTASMAGORIA FOR PIANO AND PERCUSSION; **Theodore Antoniou** — FLUXUS II; **Sytse Smit** — QUIPI. Studio guest *Pam Margles.*

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