CHROMA

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EDITORIAL

Welcome to Issue 28 of Chroma. The big news, of course, is the upcoming Australasian Computer Music Conference, to be held from 4 - 8 July at Queensland University of Technology's Kelvin Grove, Brisbane campus, capably organized by Andrew Brown and his team. The conference looks to be very exciting, with papers, workshops, and lots of concerts. Especially interesting is the involvement of the conference with the web and with radio. This should have the good effect of extending the reach of the conference well beyond the walls of QUT, and making it a more community oriented event. A schedule of the conference is given below. For late breaking information, see the ACMA website.

Also in this issue we have a number of interesting articles and reviews. Ernie Althoff is a composer well known for his sculptural sound installation, but he hasn't worked all that much with computer music per se. His article here documents the processes he went through in creating his new composition CCI - Calcareous Cemented Invertebrates. Ross Bencina is well known as the creator of AudioMulch. His article takes a more philosophical look at the issues involved in creating software, and software performance environments. Alan Dorin was one of the organizers of the First Iteration conference on Systems in the Electronic Arts held at Monash University last year. He gives us an overview of an event which I agree with him was very stimulating and a lot of fun. Lawrence Harvey writes about Canopies, his sound installation at Melbourne's Southbank, and the issue concludes with an update of my article on Windows Software which appeared in Chroma 24, and a review of a major computer music publishing event, the two CD set Soundings, a retrospective of Tristram Cary's electroacoustic music.
- Warren Burt

ACMC 2000 Schedule

Tuesday 4 July
Pre-conference Workshops
9.30 - AudioMulch
12.00 - Lunch break
1.00 - AudioBox
3.30 - End

Wednesday 5 July
9.30 - jMusic Workshop and Morning registration
12.00 - Opening Concert in M206
1.00 - Lunch
2.00 - Afternoon presentations
3.00 - Afternoon tea
4.00 - Presentations
5.00 - Concert in M206
7.00 -Evening concert at Pot Music Bar
10.00 - 12.00 - 4ZZZ Special on Computer Music

Thursday 6 July
9.30 - Presentations
10.30 - Morning tea
11.00 - Presentations
12.-00 - Concert in M206
1.00 - Lunch
2.00 - Afternoon presentations
3.00 - 5.30 - 4ZZZ Radio Documentary Broadcast
3.30 - Afternoon tea
4.00 - Concert in M206
7.00 - Keynote Speaker
8.00 - Evening concert

Friday 7 July
9.30 - Presentations
10.30 - Morning tea
11.00 - Presentations
12.-00 - Concert in M206
1.00 - Lunch
2.00 - Afternoon presentations
3.00 - Afternoon tea
3.00 - 5.30 - 4ZZZ Live Computer Music Concert Broadcast
3.30 - Presentations
4.00 - break
4.30 - Concert in M206
7.00 - Conference Dinner

Saturday 8 July
9.30 - Presentations
10.30 - Morning tea
11.00 - Presentations
12.-00 - Concert in M206
1.00 - Lunch

2.00 - ACMA AGM
3.00 - 5.30 - 4ZZZ Computer Music Talkback
8.00 - Public live to air Concert at ZZZ

Conference Highlights

- 10 Concerts scheduled over the four days
- Live to air concerts simulcast on 4zzz
- Live to web concerts
- A retrospective concert of electroacoustic works from the La Trobe Music Department, curated by David Hirst.
- Official conference bar will be "the Pot Music Bar" on Petrie Terrace, close to the conference venue. There are performances scheduled for Wednesday and Saturday night there from 7pm until late. A number of Brisbane composers will be performing their live electronica works on both nights.
- Keynote address by Zane Trow, head of the new Brisbane Powerhouse.

REALLY INTO ROCK
an arts project with old fossils.

Ernie Althoff

This essay details a multi-arts project I undertook from October 1999 to March 2000. It was funded through the New Works section of the New Media Arts Fund of the Australia Council.

I've always been a beachcomber, and, over the last 12 years at least, some of my finds have ended up as visual components in my sculptural and kinetic sound installations. In 1998 I found some lovely pieces of striped agate at the base of cliffs along Jan Juc Beach on the western Victorian coast. While looking for more, I found some beautifully smooth ovoid pebbles (max. length = 120 mm) of limestone on whose surfaces I could see a large variety of tiny fossils. With the aid of a magnifying glass I drew several of them, and started to formulate the concepts that eventually became the grant application.

During the project, Dr. Stephen Gallagher of the School of Earth Sciences at the University of Melbourne informed me that the fossils are of invertebrate organisms which lived 20-25 million years ago (Oligocene and Miocene epochs) in waters of 50-100 metres in depth and warmer than today. They include bryozoans, hexacorals and bivalves, gastropods, scaphopods, and other snails of the Mollusca phylum.

The randomness of the fossils scattered across the rock surfaces made me think about devising a chance-based system for producing artworks with these fossils. I've had experience with these systems in music composition - would they work in a non-time based situation too? Percussionist Vanessa Tomlinson reminded me during discussions that these systems can always be made to work if the right questions are asked, and I recalled my admiration for the various examples by John Cage I had encountered. I had engaging materials and a good ground plan. To work, to work!

FIRST STAGE

I first prepared a numbered master-sheet of 120 fossil images carefully rendered (The rocks hold many more!). Next came the photocopying of several pages from the RAND Corporation's book A Million Random Digits - the best set of truly random numbers there is.

Devising a set of questions to ask the numbers followed the decision to make large pencil drawings as

the artwork component of the project and the purchase of some luscious sheets of drawing paper. I compiled columns telling me which fossil image, which x and y coordinates on the drawing, its orientation in 72 degree stages (this one proved very important) and a hierarchy for bumps and overlaps. Also relevant was a 'switch-off' set of numbers to complete the work. Often I used 00 as the x or y coordinate appearing for the second time. This meant that one drawing had 154 images on it, and another had only 23. I did several drawings using different pencil weights. Then I was given some graphite sticks with which to draw - what joy! Seduced by this new medium, I did another three drawings, this time colouring the background and leaving the fossil images white: a contrast resembling the original pebbles far more than the other black-marks-on-white-paper drawings did.

THE SOUND COMPONENT

Here comes the computer at last! Rasmus Ekman's program Coagula had been shown to me, and I had heard a few pieces generated with this Graphics-to-Sound conversion package. The idea was to convert a drawing to a music work with the discrete fossil images appearing as discrete parcels of waveform information: panned, overlapped where relevant, and mixed down to stereo. Trying to scan and convert the whole drawing in one operation was going to be too cumbersome. So, after choosing Drawing No. 6 with its 108 fossils and its attendant columns of figures, it was back to the work table and on with the desk lamp to make further measurements and calculations from the drawing and produce (yes, you guessed it) more columns of figures. In doing this, the sequence of score first, computer applications second became clearer.

I don't own a computer and do not have much computer sound experience, so I hired Rainer Linz as technician and his equipment to work with me. The use of a computer was essential for this part of the project.

On to the A4 flat bed scanner went the 68 fossil images off the master sheet. After scanning, various were duplicated and rotated to their correct orientation to produce 108 ordered and numbered BMP files. The original scans were black on white and roughly cropped. **Coagula** reads colour against a black background (black = silence), so the scanner's image editing software was used to reverse the files and meticulously close crop them to ensure that fossil-based information extended across the whole file. This operation, done 108 times, took a long time.

Into **Coagula** the files now went. Each file had a duration and an upper and lower frequency range level calculated for it. Care was also taken with recording levels. Some of the thicker drawings were louder due to more component parts and partials. Distortion was avoided. Rainer Linz and I acquired experience in prediction the sound a certain shape would make. Often we were right with the easy ones; i.e. an upward slope diagonal giving a steadily rising pitch, but there was no predicting the beauty of the sonic complexity resulting from a multi-branched image.

Over to **Sound Forge**, where the columns of figures for Volume Select and Pan were consulted. Panning did odd things to the overall volumes, so Normalize again and Save.

I had originally intended the 'fossil' sounds to sit on a solid bed of noise/texture, but this concept was abandoned in favour of a cool austerity. I did add to the work five small bursts of sound derived by recording the pebbles being clicked and rubbedtogether. These were also edited, panned and volume adjusted in **Sound Forge** and given file numbers.

Finally, the 113 files were loaded into **Cool Edit** where they were simply and efficiently pasted down in their correct (i.e. number determined) locations along three channels of stereo sound from 0'00" to 40'12". To save on computer memory space and to safeguard against crashes in the hot February weather, the operation, including stereo mixdown, was done in six stages.

My end result: the work **Calcareous Cemented Invertebrates** (dur. 40'12"), March 2000, for computer generated sounds. It's a good challenge to accepted listening skills and practices, and I'm quite content

with that. My plans are to release the work on a limited edition CD-R, when I get the ten-minute prologue and epilogue works realized, to complete a 60-minute suite of conceptually interrelated works.

THE DECOMPOSING INTERFACE

Ross Bencina
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The last time I wrote for *Chroma* (over five years ago now) I was beginning to gain some insight into the degree to which my musical thinking was constrained by the representational abstraction interposed between my creative processes and the realised musical work. At the time the abstraction was the Csound software synthesis language, which I felt was hopelessly inadequate to represent my musical ideas.

My proposed solution to this representational dilemma was to keep the "implementation details" of the music separate from the musical abstractions I intended to articulate. I considered this necessary at least in part because Csound does not provide programming primitives capable of modeling anything but the most minute details of sound synthesis. The idea of decoupling the musical abstraction from its implementation is hardly a new idea. However, at the time I was used to thinking of music in terms of established concrete representational systems (common music notation scores, Csound orchestra and score files, C programs etc.), not in terms of more ephemeral abstractions.

Due to my inability to represent my musical ideas directly using Csound I began what I can only describe as a long and unfinished journey towards mastering the C++ programming language. Among other important things (such as generic programming), C++ provides language constructs to support Object Oriented Programming Ü which is still a rather fashionable concept. At the time Grady Booch was quite fashionable indeed and his book "Object Oriented Analysis and Design," struck a chord. A major thrust of Booch's thesis is that when designing software it is important to consider the design in terms of the problem space independent of the implementation space.

What is meant by the distinction between problem space and implementation space (in the Object Oriented Programming context at least) is that objects within the problem space such as employees of a particular company (to choose a droll canonical example) and their attributes and behavior are considered independently of their implementation as data structures and methods implemented in a particular software system. An advantage of this approach is that it is much easier to produce a coherent software design when you are manipulating abstractions in the problem space rather than dealing with the idiosyncrasies of particular programming languages and operating systems. There is no question that the software must be embodied with the tools to hand Ü however according to the tenets of Object Oriented Analysis and Design, implementation details should not impact the design of an object model.

As an individual programmer working alone, maintaining a clear view of the interplay between problem space and implementation space is difficult. Similar issues arise in musical composition, and much music is produced in which the problem space is heavily influenced by the implementation space. From many years I have improvised at the piano keyboard Ü sitting at the keyboard these days I am painfully aware of how the implementation details of the piano have colored my notions of the musical problem space. I feel that the same can be said of the experience of using musical software. The user interface or language primitives present the lowest limit on what is possible, all other [musical] abstractions must be built from them.

A general purpose programming language such as C++ presents an attractive vehicle for implementing musical ideas. However, many layers of abstraction lie between the graphical user interface, or textual language parser, and the digital to analog converters. Some of these abstractions may be taken as given such as digital representations of audio signals, however, as we travel up the abstraction food chain there

are an increasing number of possibilities for representing musical signals. So it is that the question arises: "What constitutes the problem space of a system designed to realise musical compositions?" It is relatively easy to answer this question for the simple case of rendering pre-existing compositions, and this has been the starting point of many existing software systems. However, it is much more difficult to arrive at a speculative definition of a minimally constrained musical problem space given no historical constraints.

The AudioMulch Interactive Music Studio software which I have been developing for the past few years is my first attempt at modeling a musical problem space. AudioMulch implements a set of musical and audio signal processing algorithms "contraptions" which may be combined using the well known patch-cord paradigm to achieve various sonic results. Although I didn't begin with a clear problem definition, AudioMulch embodies the abstractions of a typical electronic music studio: live audio inputs and outputs, signal processing "black boxes", sound sources, mixers, patch cords etc.

Sometimes I feel uneasy about the musical constraints imposed by AudioMulch.. These constraints exists partly because AudioMulch is not a mature program, and partly because it straddles the boundary between the glossy world of shrink wrapped software and the dirty world of code-it-yourself Computer Music. As AudioMulch grows to embody more of the fundamental abstractions of the field the constraints will lessen, however it may be necessary to concede that a key benefit of AudioMulch is its ability to constrain possibility to manageable proportions. For the time being at least, modeling the musical problem space remains a work in progress.

AudioMulch *is shareware for windows pcs and is available from* http://www.audiomulch.com/

FIRST ITERATION
a conference on generative systems in the electronic arts.

Conference review by Alan Dorin (co-chair)
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1st-3rd December, 1999, Monash University, Melbourne, Australia.

The First Iteration conference emerged from a perceived need to focus on the creative aspects of generating and manipulating *processes* specifically for the creation of new art works. Existing conferences on the electronic arts seemed to focus on either the technical aspects of writing software (or building hardware) for the production of works of art, or on the aesthetics of art production. First Iteration was intended instead as an avenue to explore the work and ideas of individuals who are proficient in *both* technical and aesthetic matters. These artists are in the unique position of being able to construct and manipulate processes for aesthetic purposes.

The First Iteration opening included a performance of Cornelius Cardew's, *The Great Learning - Paragraph 7*. This piece fitted neatly into the conference's scopeÜit is music which emerges from the interaction of a collection of singers individually following an algorithm laid down by the composer. Each performer sings a line of text (from Confucius) at a pitch which they can hear being sung by one of their neighbours in the choir. Alternatively the singer may choose to sing the line of text at a random pitch. After each breath (the length of a breath is determined by the individual singers, it is not specified in the score) a singer selects a new pitch. At times the piece sounds exactly as one might imagineÜa jumble of voices! At other times however sections of peaceful order develop. These are occasionally broken by randomly selected notesÜwhich might trigger a series of copy-cat notes, or might be swallowed back into the general drone. A novel piece, and one whose many moods reflected the timbre

of the conference as a whole.

The conference enjoyed three keynote speeches. The first of these was given by local computer-music composer Alistair Riddell, who spoke about the emergence of a culture surrounding the treatment of music as data. Kurt Fleischer from the Pixar animation studio U.S.A., discussed technical aspects of writing animation software tools for artists. Thirdly, James McCartney discussed the workings of *SuperCollider*, his language for audio synthesis. In addition, speakers from Europe, U.S.A. and the Asia-Pacific region presented their work to an enthusiastic and diverse crowd of tech-heads, artists, curators, theorists and many who are interested and active participants in all of these unnecessarily segregated fields.

CANOPIES; CHIMERICAL ACOUSTIC ENVIRONMENTS
an installation for a transitional space

Southgate promenade, Melbourne
January 18 to April 21, 2000
(daily from 5pm - 11pm)
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In acoustic design, discussions of space often revolve around human aural perception of spatial geometries and the various cues we use in determining our position within those geometries. In the study of room acoustics - that part of architectural acoustics which deals with sound propagation in enclosed spaces - the physical behaviour of the room in response to sound is considered by investigating sound reflection, diffusion, diffraction, absorption, sound paths and wall shapes.

These factors are used to design high performance listening rooms ranging from concert halls, through to theatres, cinemas, churches, council chambers, courtrooms and classrooms. A primary function of these spaces is the support of acoustic communication or artforms, with or without electroacoustic reinforcement. Historical changes in architectural practice for room design also develop new possibilities for music composition and performance. One historical link between architecture and music is often explored through those compositions where a building's dimensions have been mapped into rhythmic structures of a composition.

While mapping of this kind creates a metaphorical link between a composition and a building - between temporal and spatial scales - a more interesting study might exist within the physical convergence of listening experiences between electroacoustic contexts and architectural spaces. The experience of a built form can be modulated by transformations in its acoustic environment. Electroacoustic interventions offer a rich method for achieving these transformations.

Away from the built environment, strong acoustic experiences in the natural environment are usually associated with places where water is in motion, birds and other wildlife exist, or climatic elements are heard.

Exterior sites within the built environment that are designed for listening include semi enclosed spaces such as amphitheatres, sound shells and music bowls or places for respite such as sunken or walled gardens. These spaces are intended to isolate the listener from the urban soundscape and maybe focus a musical or spoken source toward a listener. When external spaces that are not isolated in any way are considered for listening, the location and physical nature of the acoustic horizon is important. The acoustic horizon of a site sets perceptual boundaries. Away from the city, this horizon might be thousands of metres. In the city it may only be a few metres, and it is a boundary in flux.

The city soundscape is by default more than by design, dominated by the sounds of industrial and

commercial activity - transportation, plant and equipment, communication. A common response in installations is to create a restorative to these urban sounds with birdsong or other recordings made in nature. While for some, the presence of birdsong without birds is disconcerting if not annoying, complaints have been made by restaurant patrons to walrus sounds mistaken for pig grunts. The latter presumably also reduced orders for trotters.

The rapid expansion during the 20th century of electroacoustic technologies for music production and diffusion also expanded the types and sites for listening to music. The possibility of placing a loudspeaker anywhere broke the traditional dependence between listening contexts and interior architectures. It is now possible to introduce an array of sonic experiences from electroacoustic music into any architectural space. Although rarely in Australia, is a sound designer or acoustician employed on a building project at an early enough stage to adequately establish these experiences with the broader context of the final project.

The Southgate Soundscape system rests on the edge of Melbourne's CBD, separated from the city by the Yarra river. The system was built into the architecture during its original construction, and is now managed by Nigel Frayne of Resonant Designs. The 160 loudspeakers of the system extend along the promenade for around 150 metres and except for a wider central section, are spread over a width of approximately 10 metres. The loudspeakers are elevated in three layers, along the first floor of the building, light poles on the promenade and balustrades on the river frontage. Various cluster groupings of speakers are possible and controlled by an audio server. (See images 1 & 2, page 15 and 4, page 16).

Canopies was created for the electroacoustic system and the surrounding urban environment. Production of the work took place between November 1999 and January 2000. During this process I began to imagine that the electroacoustic environment along the promenade might be utilised to create an inside within an outside. This inside would be richly textured in a way usually associated with a concert hall music or a dense natural environment. The outside would be the background sonic textures of the city. The inside would be acoustic environments, composed of sounds and sonic events of an ambiguous source.

These images and the speaker configuration on site suggest a covering suspended or held overhead, a canopy.

The idea of chimerical environments sets the work apart from muzak, which insists on a particular emotional reaction from the listener. Canopies avoided the use of direct recordings of natural sound, although the spectral and temporal organisation of the chimerical environments where closely related to - but not mappings of- natural environments.

chimerical: fictitious - fanciful - fantastic - fictional - illusory

Canopies is designed for a transitional space, a type of space where listeners are usually in motion. This might be a stairwell, an arcade, or the promenade of a riverside. The work was designed to create a detailed mesh of sounds in an urban environment, where the sounds often hover just above the threshold of perceptibility.

Existing conditions

Southgate promenade is not a concert hall where there are several known aspects to the listening conditions. For the most part concert hall music begins and ends at a certain time, people sit in a contained environment and the hall probably has a purpose built acoustic for several desired musics eg. 18th-19th century small or large ensembles. Visitors to Southgate move through the site with many temporal variations made from running, riding, skating, walking, sitting and dining. The site is also flooded by the city soundscape presenting several temporal and spectral layers effecting a sound work;

- a constant low frequency din from traffic, plant equipment (air-conditioners)
- sound from major construction projects such as Federation Square

- train sounds from Flinders St
- boats (tourist barges) passing and idling at a wharf close-by
- general sounds, people talking, phones, skate boards, birds, buskers,

In contrast these to conditions of predominantly low and constant sounds, Canopies is made from timbres that are mid to high, richly textured and varied. The optimum frequency response of the loud speakers on the site is between 400 and 4,000hz. The sound sources for the work included transformed recordings made from a set of woodchimes, a collection of shells, a set of beads and small brass bells and cymbals. The chimes, shells and beads were selected for their ability to create dense sonic complexes. Other material was created from various synthesis techniques and transformed vocal improvisations. (See image 3, page 15).

The field of acoustic ecology defines an acoustic environment as the perceived area encompassed by a soundscape, either an actual environment or an imagined one as produced with a tape recording and several loudspeakers. A location such as Southgate provides both environments, one embedded within the other.

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Credits...
1. *Canopies* was produced using Ross Bencina's program *Audio Mulch* with additional processing and submixing being made in *CoolEdit Pro*.

2. The project was commissioned as part of *Texture*, Southgate's public arts program.

WINDOWS SHAREWARE AND SOFTWARE UPDATE

Warren Burt
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In Chroma 24, I wrote about a number of programs for Windows. Since then, websites have evaporated and changed, programs have been updated, and new programs have come along. So I thought that a small update would be in order. This doesn't cover all the programs I wrote about then, just a few. All website information was correct as of Monday, 19 June 2000. By the time you get this, of course, it may all have changed.

ALGORITHMIC COMPOSITION RESOURCES:

1. **SoftStep** 1.3 from http://geneticmusic.com - 3 versions; Basic - Free; LE - US$39; Pro - US$129.

John Dunn, of Genetic Music (formerly know as Algorithmic Arts) has developed this very powerful set of algorithmic and compositional MIDI resources for Windows in the past year. I've been one of the beta testers and designers of some of the modules, and, quite unobjectively, I can say that the program really excites me. It's got a full set of MIDI in and out resources, deterministic and non-deterministic information generation (the best, most general purpose implementation of fractals for music I've yet seen; a wide variety of random and step sequencing resources; etc), and lots of different kinds of information processing (math functions, delays, etc.). The user interface is extremely easy to learn, and the program is fast, and versatile. If you're at all interested in making your own kinds of music generating structures, or want a versatile MIDI information processing tool for Windows, you should have a look at SoftStep.

2. **Building Blocks 2.1** from http://midiworld.com/AuReality - version 1.1 US$29.95; version 2.1 US$59.95; upgrade version 1.1 to 2.1 US $15.

Not to be outdone, Paul Swennenhuis has upgraded his already powerful Building Blocks software to include new functions and encapsulation of patches into single modules for use in other patches. And the biggest improvement of all, is that version 2.1 is much more efficient, using many less system resources than version 1.1. There are a number of interesting generation and harmonic mapping modules in Building Blocks. Those interested in structuring very determinate pitch pieces in complex ways should especially look at this new version.

3. **Infinity from SoundQuest** - current special offer price US$249.

Infinity is the third of these programs. It's a direct descendent of Sound Quests MIDITools environment, but is much, much more powerful. In fact, those used to working with Max will have no trouble at all using Infinity - the patching method and module functions are extremely similar. Like the other two programs listed above, there are a wide variety of unique functions, and connecting them together is very easy. I especially liked the remapping function which allowed any incoming MIDI signal to be mapped onto any other pattern desired. And the current version can integrate with either Cakewalk or Cubase VST. It has the ability to handle multiple MIDI sequences, so that you could, for example, trigger any number of MIDI sequences each with its own tempo map and run them simultaneously. It IS a bit pricey, but is incredibly powerful, and is well worth the price.

4. **Arborhythms** - from http://www.arborrhythms.com

Alec Rogers hasn't upgraded his unique Arborhythms set of composing resources, but he reports it does have a new website, which is listed above.

SOUND SYNTHESIS AND PROCESSING

1. **AudioMulch** from http://www.audiomulch.com - Shareware US$50, or AUD$50 for Australians if you contact Ross directly.

Ross Bencina has added an enormous number of new functions to AudioMulch since Chroma 24. Of these are MIDI control of most parameters in most of the contraptions, a whole bunch of new contraptions, greater efficiency in the program, and automation control of most functions in the contraptions, where you can draw a graph over time to change the settings on a contraption. These additions make it immensely more powerful than it was before. It really is one of the most useful and flexible sound processing and modification programs available. And it's such a deal, and it's local. Support local software writers. Pay your registration fee for AudioMulch! Or if you haven't checked it out yet, what are you waiting for?

2. **Crusher-X** from http://www.stelkens.de or http://www.crusher-x.de Shareware - US$39. Jorg Stelkens, from Munich has come up with this very attractive, flexible and powerful granular-based performance program. He calls his version of granular synthesis "vapour synthesis", and it allows 4 WAV files, and a number of oscillators, to interact simultaneously in many different ways. Plus most of the onscreen functions can also be controlled with external MIDI control. I haven't played a lot with Crusher-X yet, but I'm impressed with it, and am eagerly waiting for some free time to put it through its paces.

3. **Coagula** and **Granula-8** from http://hem.passagen.se Coagula - freeware; Granula-8 -shareware - $US20.

Rasmus Ekman has made some significant upgrades to both Coagula and Granulab. Granula-8 is an 8 voice version of Granulab, which allows MIDI control of the onscreen parameters as well. So, given sufficient processing power, you can perform granulation of 8 different WAV files at once.

Improvements to Coagula include more precise specification of graphics-to-sound conversion parameters, and a wider variety of graphics filtering resources. And seeing as how both programs are so reasonably priced, how can you afford to be without them?

4. **Vaz Modular 2.1** from http://www.software-technology.com Version 1.7 AUD$53.12 Version 2.1 AUD$446.14 (current prices in AUD as of 19 September 2000).

Martin Fay continues to make significant improvements to his Vaz Modular softsynth and sampler program. The latest version has many new modules (I especially like the waveshaper, the comb filter, and the vowel filter), more flexible MIDI control, and the ability for each voice of the synthesizer to access its own microtonal tuning table. Pieces using multiple tuning systems are now extremely easy to realize. Vaz is one of the more interesting and flexible softsynths, and I'm definitely a fan.

MICROTONAL RESOURCES

John Starrett's Microtonal Webpage.

Mathematician and microtonal composer/ performer John Starrett (he makes the meanest microtonal Country and Western on the Great Divide, pardner!) has assembled a very useful set of microtonality links on his site. Especially useful are the many software resources there. I can especially recommend Graham Breed's "MidiRelay" program, which adds proper pitchbend information to an incoming MIDI stream to enable any multivoiced MIDI module to play any microtonal scale you desire, and Chas Stoddard's temperament resources which allow you to access and hear your compositions in any one of a vast number of historical temperaments.

TRISTRAM CARY: SOUNDINGS - Electroacoustic Works 1955-1996

Tall Poppies Double CD TP139. - reviewed by **Warren Burt** waburt@melbourne.dialix.com.au

"...I confess to sleepless nights in contemplation of a time when my tapes are left to rot in someone's garbage can. And, in this imaginary theatre, I think I see each fleck of oxide parting from the mylar like so much sunburned skin - and I can do nothing. It is not an image which I am, yet, able to face gracefully..." - Robert Paredes, *Empty* (1993)

Over the years, a treasured part of my library has been the reel to reel copies of Tristram Cary's electroacoustic works that he gave me. However, the ravages of time have taken their toll, and these tapes are now a gummed up pile of oxide flakes. What an absolute pleasure then, to hear from Tristram a few weeks ago, and to receive a copy of the new two CD set of his electroacoustic works on Tall Poppies. Released in time for his 75th birthday, the set has over 2_ hours of music, ranging from early tape music works such as "The Japanese Fishermen" (1955) to recent works such as "The Impossible Piano." Finally, I can hear the works again, this time in a medium which, hopefully (accelerating technologies notwithstanding), will outlast the both of us. (It's not that I'm into musical immortality or anything like that, you dig? I just want the ability to enjoy his work for the period that I happen to be here, right?)

And what a pleasure re-encountering the older works is, and what a joy to hear works that I hadn't known previously! Let's be perfectly clear: The release of this 2 CD set of Tristram Cary's electroacoustic works is a major event for new music in Australia, and a significant event for international computer music. There are a number of works of historical technical significance here (such as the first all electronic soundtrack for a BBC radio play), but what is more important, these works, decades later, sound great. They are good music, and not just significant demonstrations of what the technology of the time could do.

The two CDs are divided into works for analogue tape, from 1955 - 1978, and works for computer 1979-1996. Some of the analogue works from the 1950s have been processed and cleaned up with the computer, but as Cary says in his wonderfully comprehensive liner notes, in those cases, he was careful not to use any technique he did not have available at the time of his composing the original work. One of the most attractive things for me about the CDs is how "commercial" works and "art" works are placed side by side and sit so happily together. For example, after the purely abstract analogue complexity of "Continuum" (1969), we get the absolutely programmatic radioplay soundtrack "Suite - Leviathan '99" (1972), and both works hold up extremely well, and are absorbing listening. In fact, if you didn't read the program note for "Suite - Leviathan '99", you wouldn't realize that the work had any but a purely musical origin. What would be noticed is that there is a more "instrumental" approach to making some of the sounds in "Leviathan" than in "Continuum", but this comes across more as an aesthetic difference rather than as the result of any external constraints placed upon the composer by the circumstances of the works origin.

"Continuum" is a work for voltage controlled equipment, and has some very attractive sounds. At its thickest, about 40 layers of sound are operating, and they make a wonderfully dense cluster. The piece comes as if from a great distance, has three episodes of getting thicker and thinner, more and less dramatic, and then recedes away, as if we heard only three episodes from an infinite process of growth and decay. This sort of "glimpses of a few aspects of an infinite process" is a form that Cary will use again and again in his career. Somewhat similar cyclical forms, which imply that the material heard is infinitely repeating, are also used extensively. "Suite-Leviathan 99" (1972) is not cyclical, but is a more thundery and dramatic piece. There are a number of sounds which appear and reappear throughout the work, such as the pan-pipe like melodies which indicate the character Quell. I found this piece a very enjoyable listen.

"3 4 5 - A Study in Limited Resources" (1967) is one of my favourite electronic music pieces by any composer. Every time I hear it, I smile. In this piece, Cary takes an absolutely ridiculous premise - using only frequencies of 3, 4, 5, 30, 40, 50, 300, 400, 500, 3K, 4K, 5K, and 30K, 40K, and 50K cycles - and proceeds to make an absolutely serious and very fun piece using it. The subsonics are heard as rhythmic articulation, as well as pounding sounds on their own, the supersonics are used as modulation frequencies, producing a whole range of interesting textures. This is virtuoso composing at its best - using absolutely rigid restrictions to produce an engrossing piece that couldn't have existed any other way. If you ever encounter anyone who gives you all the old dreary arguments about how serialist thinking couldn't have produced good music because of how its premises violated psychoacoustic realities of human hearing blah blah quack quack, just play them this austere and beautiful piece and giggle. The original issue of this piece, by Galliard in 1970, as a 7 inch phonograph record, had the score included. The liner notes with the CD also include a page of the score, which while not as good as the whole thing, at least gives an insight into Cary's thought processes as he put this very entertaining piece together.

"The Children of Lir" (1959) is the first all electronic soundtrack to a BBC radio play. It's a classic piece of musique concrete, where sped up and slowed down sounds abound, and dramatic climax is achieved through the use of slow tape speed change. It's interesting to hear these simplistic effects after many years. It's true, as effects, they are simplistic, but they sound good! The combination of extreme simplicity and complexity in this piece - the fragment of electronically accompanied folk song is a good example - is an attractive one, and the piece is very effective.

"Birth is Life is Power is Death is God is..." (1967) is, as the title implies, another of the cyclical pieces. It's a tape piece put together from soundtracks used for a multiscreen film shown at Expo 67, in Montreal. (Note to postgraduate students: there's a thesis topic in researching all the many electronic music installations commissioned for use at World's Fairs and Expos!) Materials from the nine 4_ minute loops of sound used for the piece are reassembled into a 9 minute piece, which has dramatic powerful surges of sound alternating with textures that today, we would call "granular." The piece also showed me the importance of the reverb unit in music from this period as a tool of synthesis itself, and not just as an

embellishing tool. That is, the timbral world of these pieces would be unthinkable without the long decays of sound afterglow produced by these early reverb units. These afterglows quickly become heard as essential sounds in themselves, and not just as residues of the sounds of their origin.

"The Japanese Fishermen" (1955) is the oldest of the pieces here, and also one of the newest. The original materials for the BBC radio programme soundtrack (concerning Japanese fishermen killed by US atomic testing in the Pacific in the early 50s) existed on 78 rpm mono acetate disks. Cary transferred these into the computer in 1996, micro-editing out the acetate clicks, and then assembled them into the piece here. When assembling the piece, he was careful not to employ any techniques he did not have available at the time. The resulting piece is dark and moody, with some absolutely beautiful sounds. Japanese noisecore fans will be interested in this piece, which is a clear precedent to the kinds of sounds and organization that appeal to them.

"Narcissus" (1968) for flute and two tape recorders is a classic. The two tape recorders have prepared blank tape on them, into which leader tape of specified lengths has been cut. During the performance, the electronics performer records, plays back, reverses the direction of the tape, and changes the speed of the tape recorders, following the instructions on the score, a page of which is also included in the liner notes. The flute part is in a mid-20th century "modernist" style, with wide leaps, fast ornaments, and great timbral variety. It's lovely. And when the tape playback starts, the nature of this "modernism", which is an updated response to impressionism, becomes clear. Another thing I realized in listening to this piece is how much the sound of analogue tape speed up itself is part of the timbral "corona" of the electronic music of this period. By the end of the piece, "Narcissus" is as lush and evocative a sound world as you could wish for.

The first CD ends with "Steam Music" (1978). This is a collage of recordings of steam engine whistles. How fitting that Cary's work with tape music should end with a piece that uses the exact techniques - tape collage - that started off the genre. There are some luscious sound textures in this piece, but they require careful listening. The combining of the different recordings, made in different environments and at different distances, creates a quite surreal soundscape that I often found myself quite lost within.

The second CD features works for computer from 1979 - 1996. There are no soundtrack works on this disk, but some of the works were intended for use in installations. "Nonet" (1979) which starts off this disk, was realized at Stanford University's computer music studio, and is a small jewel of early computer music. What I like most about this work is its timbre, or maybe a better description might be its "feel." The combination of the steady-state electronic tones with the slightly sour 18 tone equal tempered tuning, the multilayered dynamics, and the now slow, now skitteringly fast melodies, create a sensuous sound world that I just want to "sit in" for a long time.

"Soft Walls" (1980) was one of the first pieces Cary made on the Synclavier I he installed at the late electronic music studio at the University of Adelaide. This is a piece in which steady tones, raspy FM tones, and gliding or wobbling tones all mix and coalesce. Changes in intonation in this piece are also very sweet. Glissandi of harmonic series arpeggios alternate with very "out of tune" sounding sound complexes. Intonation is here used as a means of creating harmonic and timbral contrast. The piece moves between several timbral worlds, giving glimpses into each of them before turning to another. This is another of the pieces that I feel implied was a larger set of potential musical events than were just presented by this one realization.

"Sine City II" is a 1996 remake of materials from 1979. It's a piece made up of many many sine waves, producing a kind of steady state piece which, because the sine waves are sometimes gliding, and always coming in and out at different rates, creates a smoothly evolving world of gently changing beats and shimmering dissonant harmonies. I found this piece especially rewarding on headphones. The changes in the apparent physical mass of the sound, as tones appeared and disappeared in each ear, was sensuous in the extreme.

"Black White and Rose" (1991) is a piece for Marimba, Gongs, Woodblocks and Tape. The tape is

mostly made from transformed samples of the original percussion instruments. This is a piece about contrasts, and juxtapositions. Often the original sounds, with attacks, are modified so they are steady state sounds (a latter-day use of reverb to create clouds of sound from an initial short sound) with non-percussive envelopes. And there is an interesting harmonic contrast as well. Tape and instrument alternate which plays diatonic material while the other plays pentatonic material. That is, one plays the "white keys" while the other plays the "black keys". The use of diatonic material here is rendered all the sweeter by being mixed at times with noise-based textures, so that when the diatonic moments occur, they provide moments of harmonic "breathing space", rather than simply being presented as the whole musical story. It's a very rich piece, and presents a bit of an epic musical journey. Each moment can be sparse or even soloistic, but as the piece progresses, and you remember bits of it, you realize the enormous range of musical material you've experienced.

"Tree Clockpieces" (1983/96) are shorter excerpts from a longer work composed in 1983. They are delicious polyrhythmic miniatures, with sometimes as many as 12 simultaneous tempi occurring. Three byte sized bits that left me wanting lots more. For these pieces, Cary wrote a program that allowed him graphic control over certain of the parameters of a piece. This program was used more extensively in "Trellises" (1984), his final work on the Synclavier system. "Trellises" is another infinite piece, which uses similar timbres to those developed by Cary for "Soft Walls". This 12 minute excerpt from a potentially infinite piece only explores part of the territory that the program could visit. There are many attractive moments. I was especially taken by a section around 7:20, which featured descending chromatic scales. The kind of structure of this piece and pieces of its kind from this period - a non-directional wandering around a few rooms of a potentially vast world - was a prototype for the structure of the world wide web. So do the kinds of structures artists use in their work leak out to become structures that are then accepted as normal by the rest of the world.

The computer CD finishes up with a series of excerpts from the 1994 "The Impossible Piano (Homage to CN)" for sequencer and sampled piano. The confluence of the computer sequencer, the sampler, and Conlon Nancarrow's work was a stimulus for many composers in the late 80s and early 90s. (Note to postgraduate students no. 2: A thesis exploring the many pieces written for computer controlled piano sounds in this period.) Cary's pieces are delightful polyrhthmic pieces, using melodic and rhythmic material derived from manipulations of the letters of Conlon Nancarrow's name. Much of the melodic material is diatonic, and the result are pieces which while diatonic, are not "tonal", but have a very wistful sound. I recall a brief conversation with Cary during this period, where he said that he had come up with a different way of handling C major. These pieces are a result of that, and they do indeed provide a different way of looking at one of the oldest (at least 4000 years) of musical scale formations. Of the individual movements, I found "Counterpoints 6", with its 8 short sections stopping and starting, and "Power Bounces 4", with its chords which degenerate into separate rates of "bouncing" for each of the component notes, to be especially attracting in both overall sound and form.

This two CD set is valuable not only for its historical merit, but also for the wonderful music it contains. To travel through 41 years of electroacoustic music with Tristram Cary, one of the pioneers of the genre, hearing the products of his eager, exploratory mind, and his sense of musical charm, is a great privilege, and one I recommend.

ACMA CONTACTS:

WEBSITE
www.acma.asn.au

ACMA has a new website. Maintained by Ian Whalley (musik@waikato.ac.nz), it has all the up-to-date information about ACMA events. It also has Chroma 24 - 27, and this issue as either pdf or html files. Applications for membership in ACMA can be found there too! Many thanks to Ian for his hard work on

this.

DISCUSSION LIST
acma-L

acma-l is a listserv discussion group hosted by the Department of Music at the University of Waikato (Hamilton, New Zealand) for the Australasian Computer Music Association . It acts as a forum for discussion amongst participants throughout Australasia and beyond. ACMA membership includes composers, performers, educators, researchers, computer scientists and others with an interest any aspect of the many forms of electronic music. Currently you do not need to be a member to subscribe to the list.

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To avoid complication, do not use an email signature when subscribing/unsubscribing.

Image 1: Southgate Promenade, Melbourne. This image shows about two-thirds of the total length of the site.

Image 2: Southgate Promenade, Melbourne. This image shows the width of the site. Several stereo fields were created between the riverside railing and the upper floor of the building.

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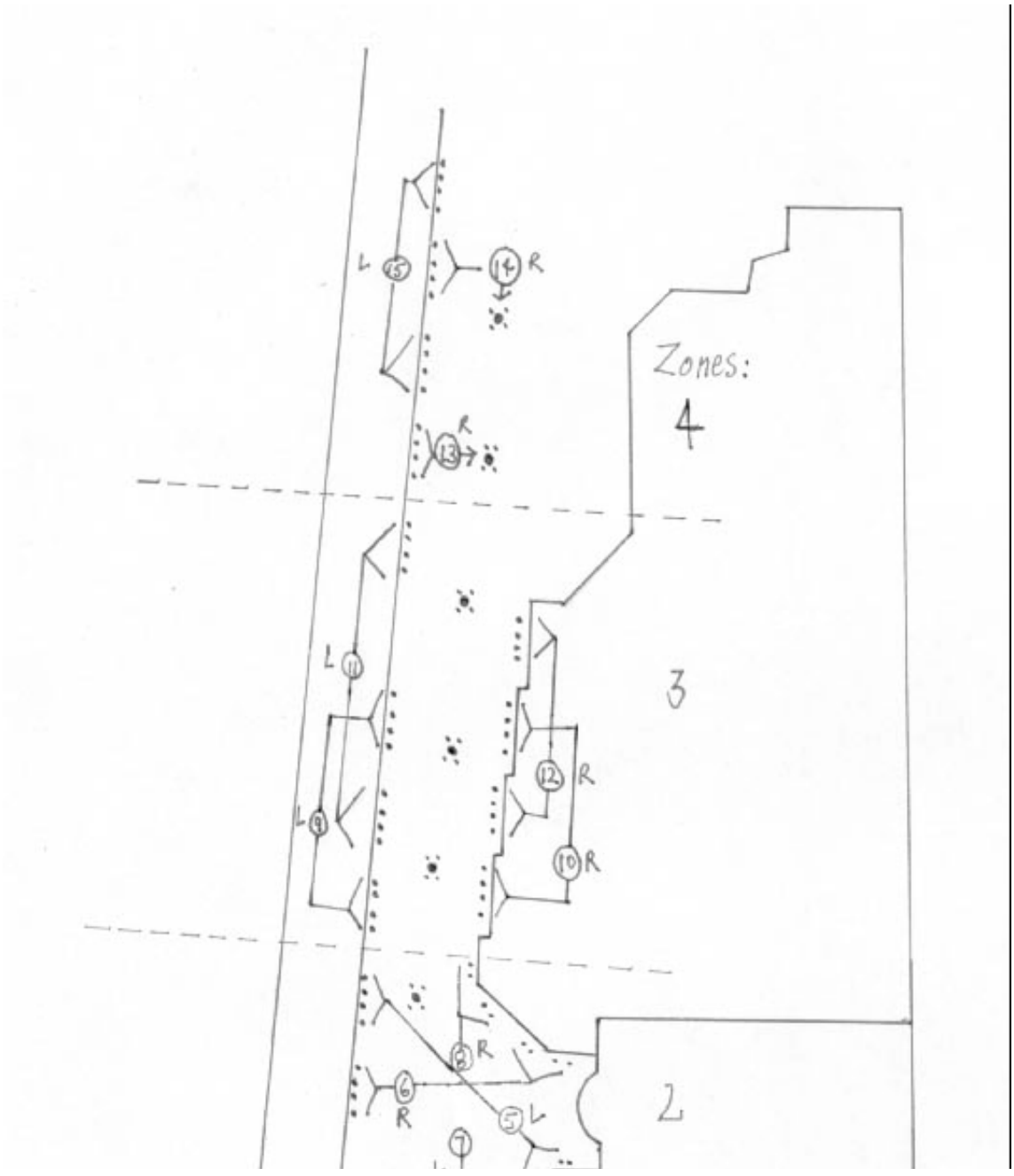
Image 3: Temporary recording hutch showing several of the sound sources used in Canopies.



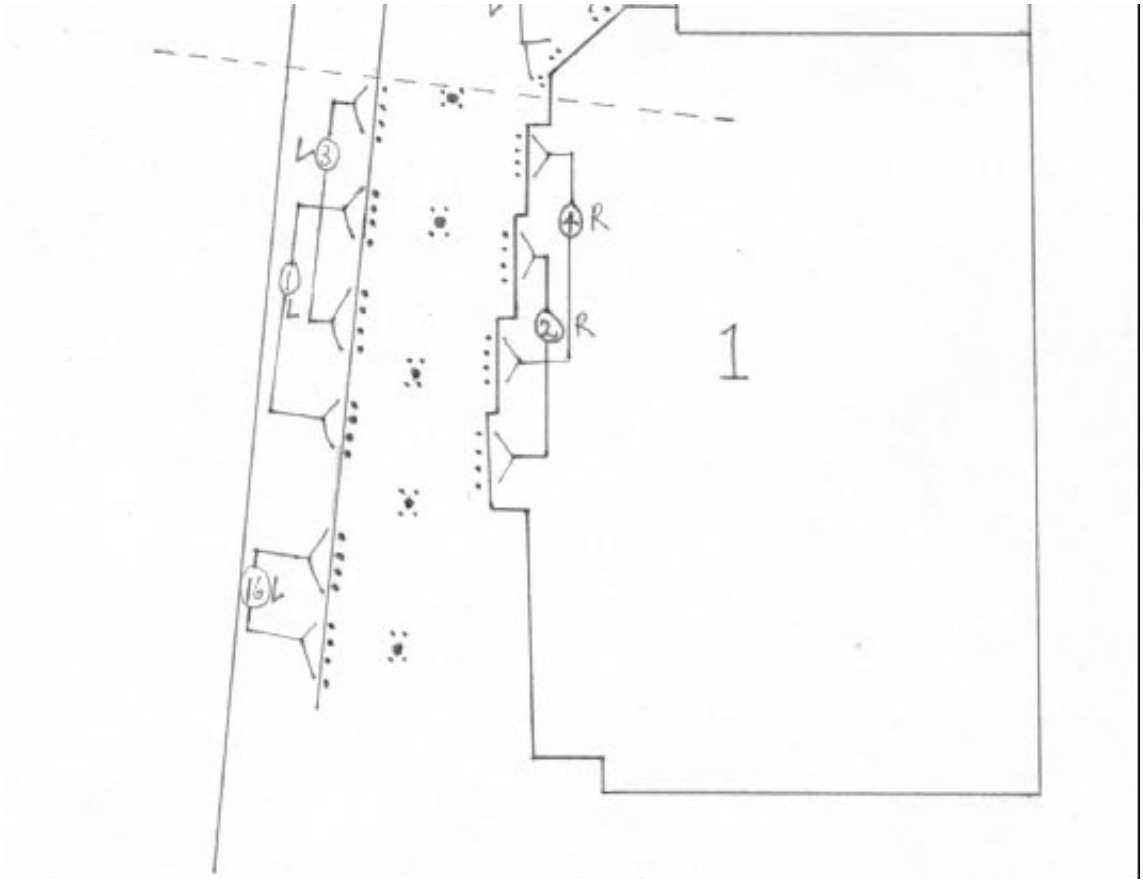


Image 4: See next page. Site plan of the Southgate Promenade and speaker locations. The loudspeakers are wired in groups of four, and can be paired with other groups of four. The numbers in circles show the speaker pairings used in Canopies. A stereo file can be sent to multiple channels creating overlapping fields such as those in zone 2. In the diagram, L = left and R = right.
